Multicast Video Distribution System
MVDS X-1

Installation / User's Guide

silex technology

Introduction

Thank you very much for purchasing Silex's MVDS X-1, the Multicast Video Distribution System (this product).
This manual provides how to setup and use this product.

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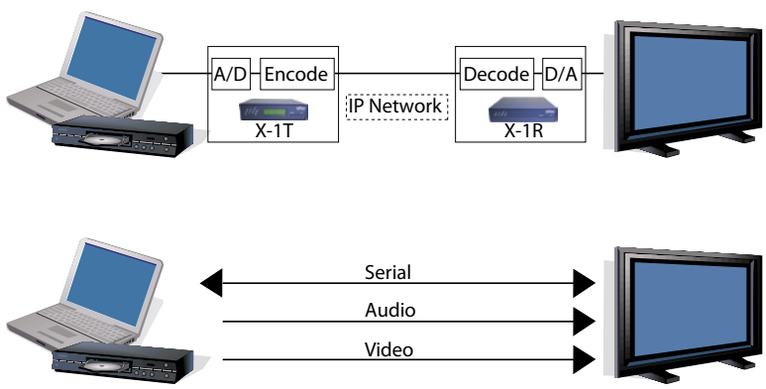
Product Overview

1.1 About this product

MVDS stands for "Multicast Video Distribution System", which allows to distribute video or audio data from Player (e.g. PC, DVD player, etc) to Display (e.g. TV, Monitor, etc) by IP Multicast.

The MVDS consists of transmitter and receiver(s). The transmitter is connected to Player and the receiver(s) are connected to Display. Transmitter encodes the signal output from the Player (e.g. video, audio, etc.) and distributes its codec data to receiver(s) in real time, and the receiver(s) decodes and outputs it on Display.



Feature

Video and Audio control

- Adopts JPEG2000 codec. High compression with less image degradation available
- Audio codec: 16bit stereo PCM (Sampling rate: 32KHz)
- Screen size supports WXGA (1280x768)
- Up to 30fps of frame rate
- Synchronization function for video and audio (Lip-sync)

Network control

- Allow simultaneous distribution to multiple receivers by multicast (up to 32 receivers)
- Time correction between transmitter and receivers allows simultaneous output among receivers
- Support Wired LAN(10Base-T/100Base-TX) and Wireless LAN (IEEE802.11a/g: Infrastructure/ad hoc mode)

Others

- Support 1ch of serial port for remote monitoring and control
- Various configurations are available on embedded Web page
- Switch the transmitter automatically at a specified interval
- Connection and communication status can be verified at LCD (Transmitter only)
- Receiver's ID (host name) can be set by rotary switch (Receiver only)

1.2 Specification

1.2.1 Hardware specification

Hardware specification is as follows:

CPU		TOSHIBA TX4939 400MHz (32/64bit MIPS)
RAM		128MB DDR
ROM		8MB
Interface	Video	Analog RGB D-SUB15 x 1
	Audio	16bit Stereo line in / out (Mini Jack)
	Serial	RS-232C (D-SUB9) x 1
	Ethernet	10BASE-T/100BASE-TX Auto detection (RJ-45) x 1
	Wireless	IEEE802.11a/b/g mini PCI module x 1 (SX-10WAG)
Power		AC adapter (Operating voltage 15V)
LCD		16 Characters x 2 Lines (Transmitter only)
LED		4 Front Side "Power" / "Status" / "Wireless" / "Ether" 2 Back Side RJ-45 "Link" / "Status"
Push Switch		4 Front Side "MEMU" / "-" / "+" / "SET"
Rotary Switch		2 (Receiver only)

FCC Notices

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for assistance.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

1.2.2 Software specification

Software specification is as follows:

Protocol

TCP/IP	Network Layer	ARP , RARP , IPv4 , ICMP Multicast : IPv4 Organization Local Scope 239.192.0.0/14
	Transport Layer	TCP , UDP
	Application Layer	TELNET , BOOTP , DHCP , HTTP , UPnP , JCP (proprietary #19541) , RTP (proprietary #50001 - #65535) , MVDS Announcement Protocol (proprietary #50000) SX-RPC (proprietary via HTTP/RTP)
Others	FLDP	For firmware version up

Other

Serial	Data Transfer Protocol	Proprietary

1.2.3 Interface specification

Interface specification is as follows:

Video

Interface	Analog RGB (15pin Dsub)
Codec	JPEG2000
Resolution	1280 x 768 pixel (WXGA)
Flame rate	30 fps (MAX)
Configuration	Video Adjustment(Contrast , Bright , Position etc…)
Others	Startup screen, Stop signal screen, Maintenance screen (Display a still image specified in each mode.)

Audio

Interface	Stereo mini jack
Codec	16bit PCM
Sampling rate	32 (KHz)

Serial Data

Baud rate	300 , 600 , 1200 , 2400 , 4800 , 9600 , 14400 , 19200 , 38400 , 57600 , 115200 (bps)
Bit length	8 , 7 (bit)
Stop bit	1 , 2 (bit)
Parity	NONE , EVEN , ODD
Flow Control	NONE , XON/XOFF , RTS/CTS
Timeout	50 to 1000(ms)

1.2.4 Notes on the radio wave

Do not use this product near the following equipment or places.

The following equipment may use the same band. If you use this product near this equipment, the radio waves from this product and the following devices may interfere with each other.

- Microwave, scientific instruments, pacemaker or other medical equipment.
- Licensed radio station in a factory.
- Small power radio station (a non-licensed radio station).

Do not use this product near a cellular phone, TV or Radio.

A cellular phone, TV, and radio use different radio bands than our product. Generally if they are used near this product, it will not cause a problem. However, when near this product, sound or image noise can happen.

If there is reinforced concrete/metal between wireless devices, they may not connect.

This product can connect through wood or glass, but can have trouble communicating through reinforced concrete/metal.

Wireless Equipment for 2.4GHz and 5GHz band

This frequency band is used by a microwave, industry, science, medical equipment and licensed in room or low power (non licensed) radio stations.

- Before you use this equipment, verify that it will not interfere with other broadcasting.
- If interference happens, stop using the equipment or change the band. Contact us to discuss ways of avoiding interference (example: create the wall).

1.3 Network composition

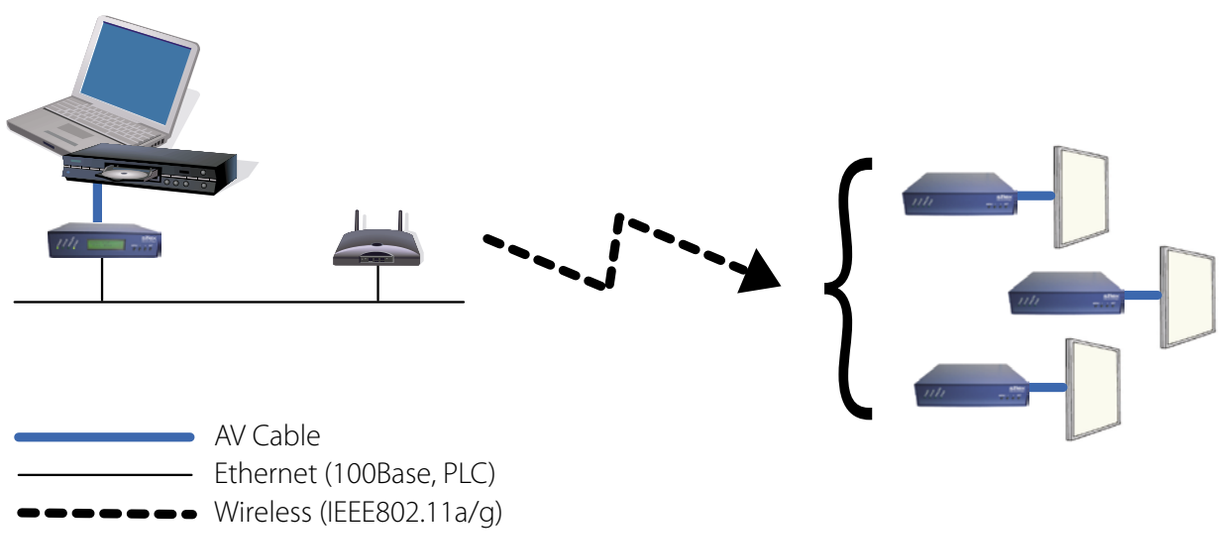
A MVDS network is composed of one MVDS transmitter and 32 MVDS receivers (at maximum). In each group, a video or audio data are distributed in multicast (or unicast).

As for network interface, both Wired and Wireless LAN ports are supported. Since MVDS transmitter and receivers exchange their status each other regularly, you can easily install and configure this product as well as support various network environment.

- UDP is used as a protocol for data distribution and information exchange.
- Not available via an Internet.

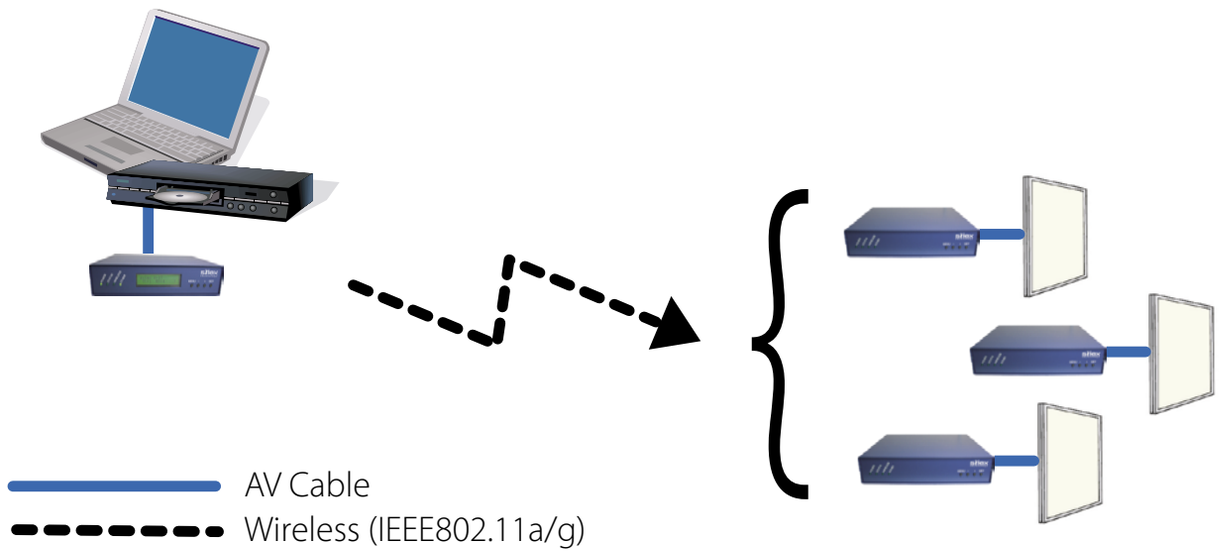
Wireless system - Network composition for Infrastructure mode

The player (e.g. PC, DVD player, etc.) outputs data (e.g. video, audio, serial data, etc.) to MVDS transmitter. The transmitter captures and sends them to Access Point via a wired LAN. These data are distributed to the MVDS receivers being connected to the Access Pint in Infrastructure mode.



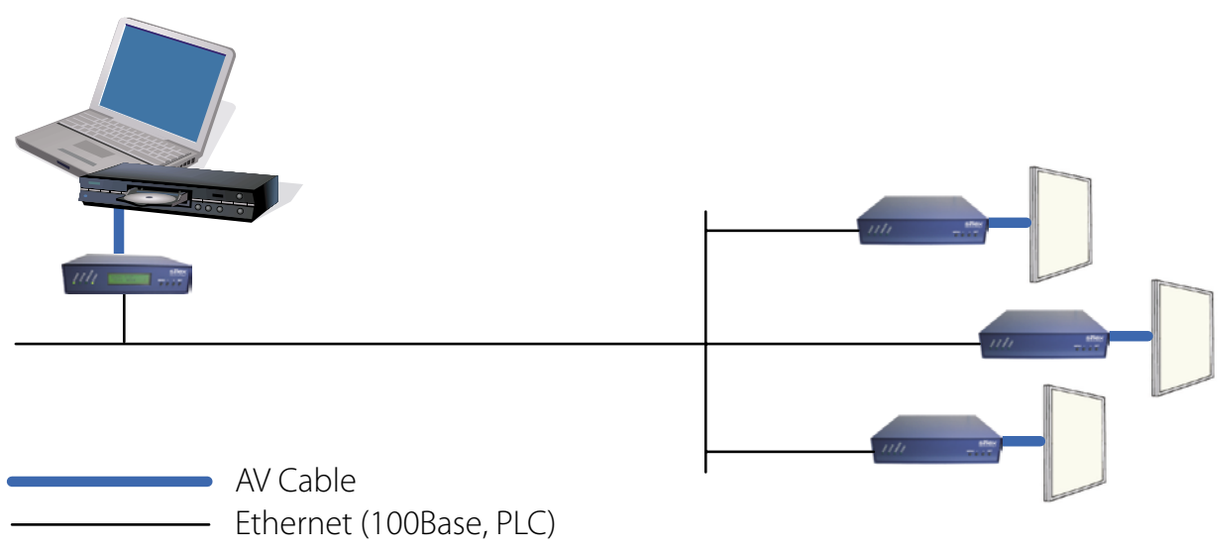
Wireless system - Network composition for Ad-Hoc mode

The player (e.g. PC or DVD player, etc.) outputs data (e.g. video, audio, serial data, etc.) to MVDS transmitter. The transmitter captures and sends them to the MVDS receivers being connected to the transmitter in Adhoc mode.



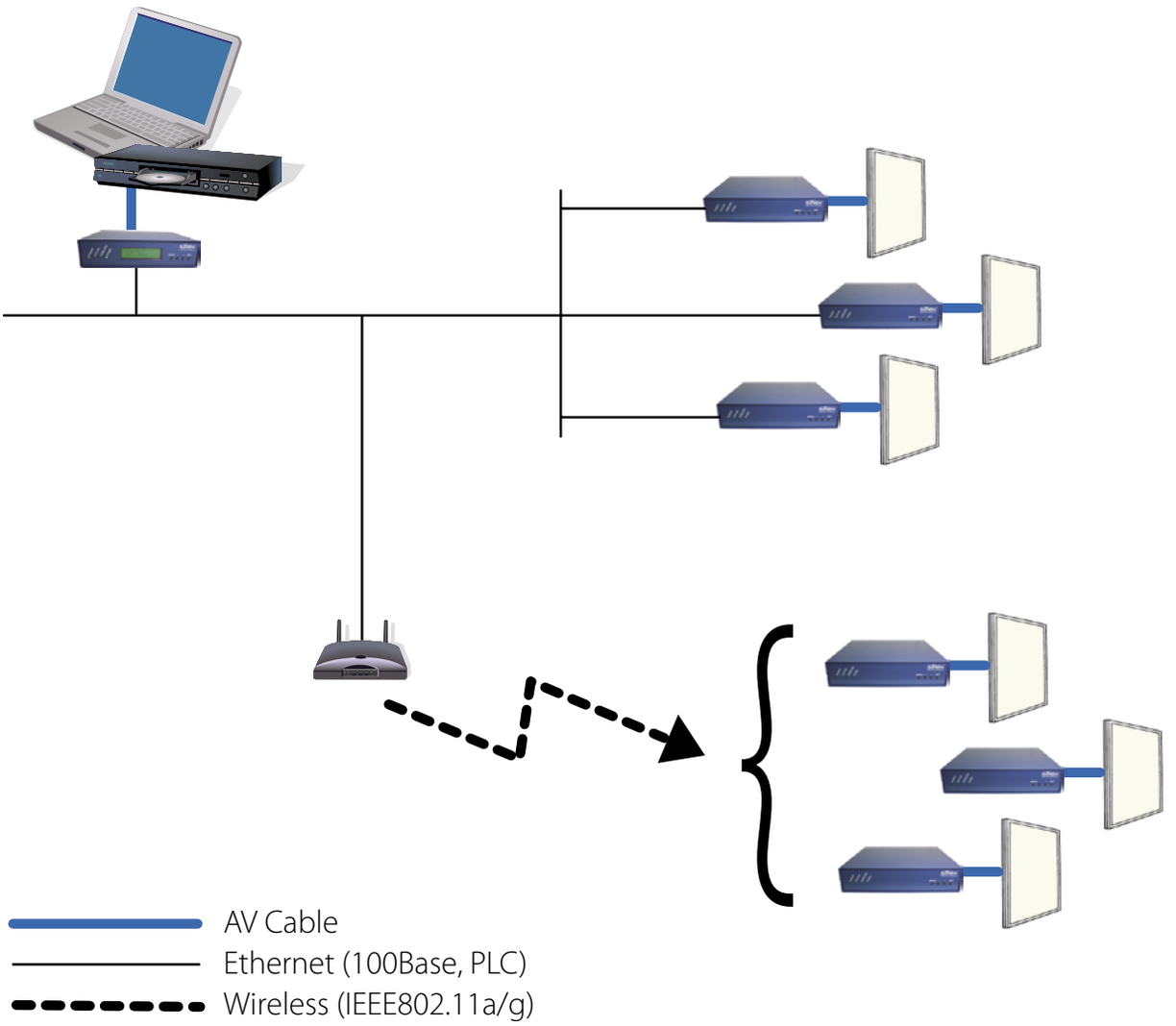
Network composition for wired connection

The player (e.g. PC or DVD player, etc) outputs data (e.g. video, audio, serial data, etc.) to MVDS transmitter. The transmitter captures and distributes it to the MVDS receivers being connected to an Ethernet LAN.



Network composition for wired/wireless connection mix

If the wired/wireless system are mixed, you can support wider variety of environment.

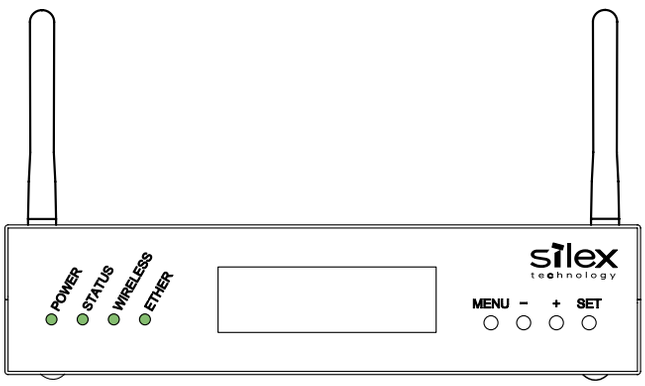


1.4 Parts and function

The name of each part and the function are explained below:

Front

Transmitter

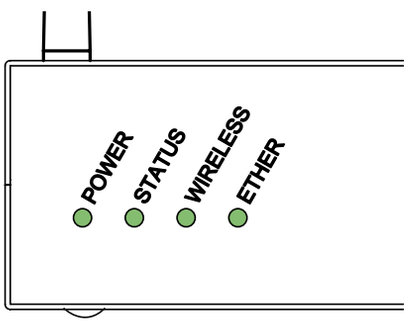


Push button	Description
MENU	Go into LCD menu from initial screen. Return to initial screen from LCD top menu. Go back to higher level in LCD menu. Start a factory default configuration when this button and [**SET**] button are pushed together while turning on this product.
-	Return to previous option in LCD menu. Select a value to set.
+	Move to next option in LCD menu. Select a value to set.
SET	Go into the selected menu in LCD menu. Enable the selected value. Start a factory default configuration when this button and [**MENU**] button are pushed together while turning on this product.

Receiver

Push button	Description
MENU	Start a factory default configuration when this button and [**SET**] button are pushed together while turning on this product.
-	Not use.
+	Not use.
SET	Start a factory default configuration when this button and [**MENU**] button are pushed together while turning on this product.

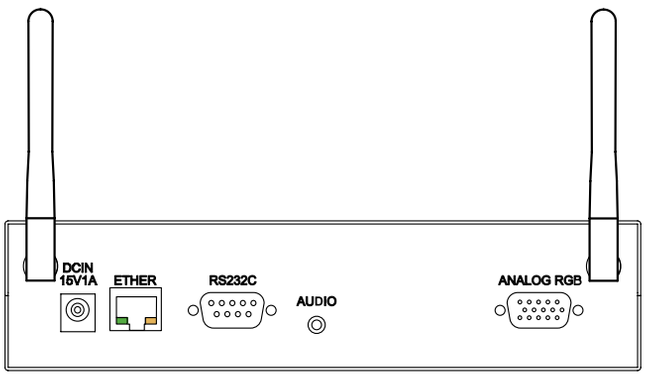
LED (both Transmitter and Receiver)



LED	Description
POWER	OFF: Powered off or being on boot process. ON: Powered on (Normal status)
STATUS	Blink: Blink every time when codec of 1 frame data is complete. ON: Factory default configuration using push buttons is complete.
WIRELESS	OFF: Wireless communication is disabled. Blink: Wireless communication is not established. (Detecting AP or other node, or unable to connect for wireless configuration mismatch). ON: Wireless communication is established.
ETHER	OFF: Not connected to wired LAN (Not linked) ON: Connected to wired LAN (Being linked)

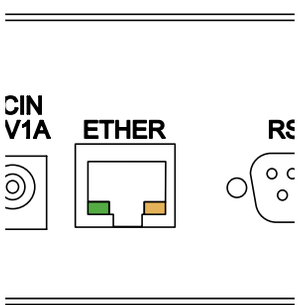
Back

Both Transmitter and Receiver



Part	Description
DCIN 15V1A	AC connector (15V 1A) * In case of X-1ER, AC power can be supplied via internal DC connector.
ETHER	Ethernet interface (RJ45)
RS232C	Serial interface (9pin Male)
AUDIO	Audio interface (3.5mm mini)
ANALOG RGB	RGB interface (D-Sub15pin)
Antenna	SMA Connector (Connect the antenna to either or both of the connectors.)

LED (both Transmitter and Receiver)



Ethernet LED	Description	
Backside (Ethernet Connector)	Green	OFF: Not connected to a wired LAN (Not linked)
		ON: Connected to a wired LAN (Linked)
	Orange	Blink: Blink when receiving a packet via wired or wireless LAN.
		Flash: Data error in a configuration area ROM/RAM check error

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Installation

2.1 Before you begin

This section explains the necessary actions that should be taken before you connect and setup this product.

2.1.1 Necessary items

Please prepare the following items.

MVDS Transmitter (X-1T)	One transmitter is required.
MVDS Receiver (X-1R)	As many receivers as you need for your environment. Each receiver supports one monitor, and up to 32 receivers can be configured for use with a single MVDS transmitter.
PC (used for setup)	A PC with a wired LAN (100BASE-T) port.
Player	A media player with VGA interface and 1280x768 60Hz support (the player can be a PC or any other device that can output video in the required format using a VGA interface)
Monitor	A monitor with VGA interface and 1280 x 768 60Hz support (up to 32 monitors total)
Speaker	Up to 32 stereo speaker pairs (not necessary if the speaker is embedded in the monitor above).
VGA cable	VGA cable (male/male) with D-Sub15 pin connector and noise suppression. One cable is required for each transmitter and each receiver.
Audio cable	Cables with 3.5mm mini plug connector and noise suppression. One cable is required for each transmitter and receiver.
LAN cable (used for setup)	Category 5 or better LAN cables for connecting the PC to the transmitter and to the receiver(s) for configuration purposes. * Either straight cable or crossover cable can be used as Auto MDI-X is supported. * An Ethernet hub can be used, but is not required.
Antenna	An antenna is required for each transmitter and receiver. The MVDS transmitters and receivers include 2dB antennas, but you may wish to use more specialized antennas to provide better performance. Select the antenna according to your location status, distance from the receiver or layout. The MVDS transmitters and receivers have 2 antenna terminals. You can use both terminals as they automatically recognize which terminal is in use. The antenna is not required during the installation.
Configuration Software	Use AdminManager. You can download AdminManager from the Silex website: http://www.silexamerica.com/adminmanager-software-download.html

2.1.2 Create environment for setup

The first step is to connect the cables to the MVDS transmitter and receiver, and to the player, monitor(s) and PC. All the configuration can be performed via a wired LAN network.

1. **Connect the LAN cables**
   Connect the MVDS transmitter and receiver(s) to the PC using LAN cables.

2. **Connect the VGA cables**
   Connect the player to the MVDS Transmitter, and connect the monitor(s) to the receiver(s).

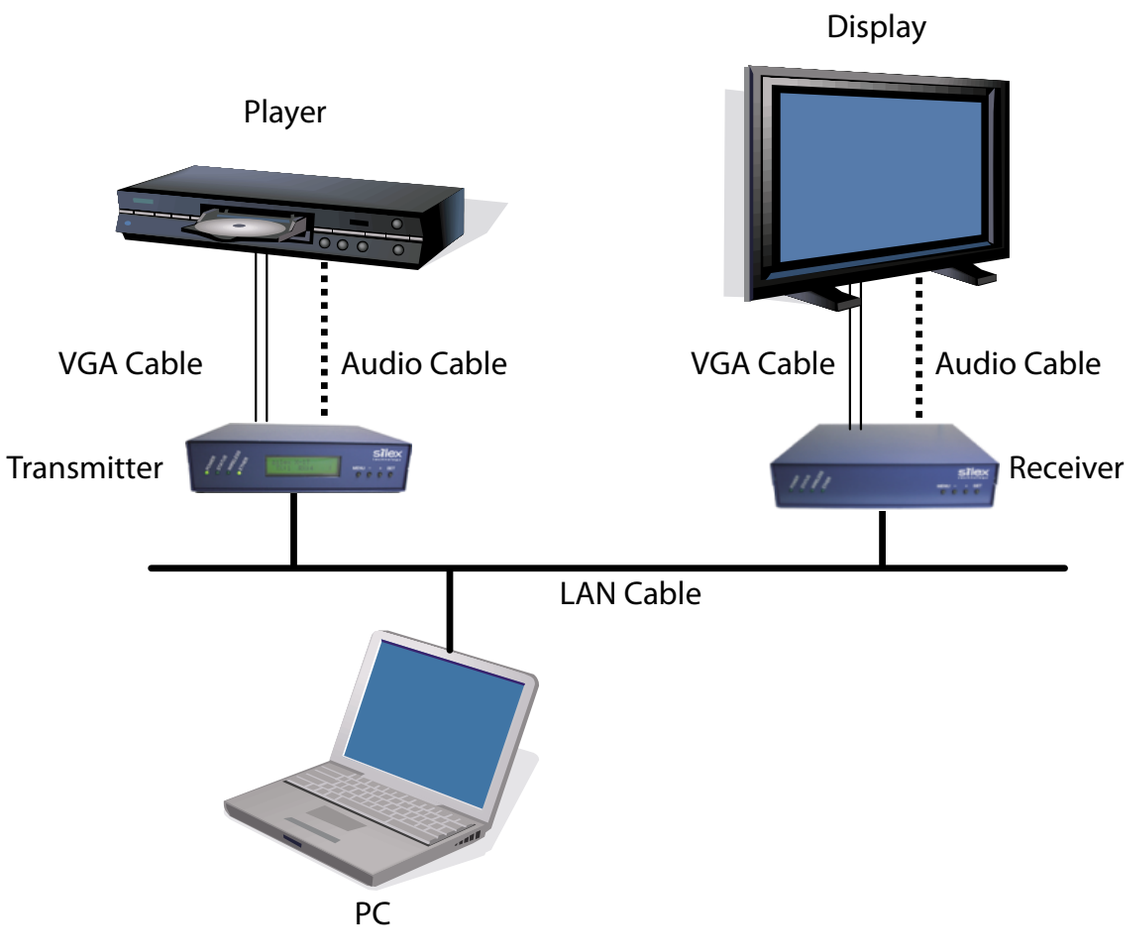
3. **Connect the audio cables**
   Connect the player to the MVDS transmitter, and connect the speaker(s) to the receiver.

4. **Power ON**
   Turn on the MVDS transmitter and receiver, the PC, the player and the monitor(s) and speakers.

5. **Start output from the player**
   Output a movie (1280 x 768) from the player.
   Or to make an adjustment to the screen image at the MVDS transmitter, output a still image (white or any other light color) from the player.

<Connection example>

An example MVDS installation is shown below:



2.2 Configure this product

When the cable connections and power on are completed, configure the network settings and adjust the screen images for the MVDS transmitter and receivers.

2.2.1 Assign IP address

To simplify the configuration process, the MVDS transmitter and receivers support automatic configuration of the IP address. By default, they attempt to load an IP address via DHCP when powered on. If no DHCP server is found, then the transmitter and each of the receivers are loaded with a random IP address of 169.254.xxx.xxx. Note that the same IP address is used for both the wireless and wired networking functionality.

Note

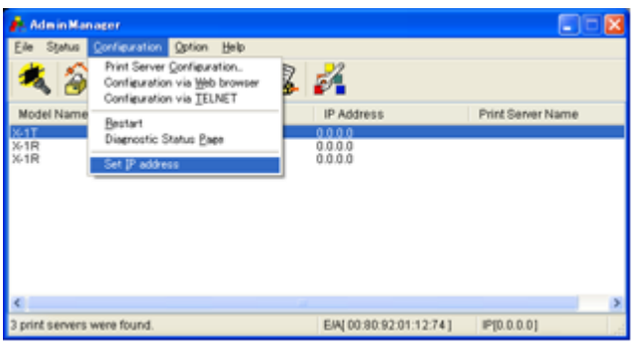
- If you are using the automatic configuration process, you may skip to the next section.

If you prefer, you can use Admin Manager to manually assign an IP address for the MVDS transmitter and for each MVDS receiver:

1. First assign a static IP address to the PC that you are using for setup.
   (Example: 10.10.10.10)

2. When you run the Admin Manager program, a list of the available MVDS transmitters (model X-1T) and receivers (X-1R) will appear on the main Admin Manager screen.

3. Select the MVDS transmitter or receiver that you wish to configure. From the top menu, click **Configuration** - **Set IP address**.



4. Configure a unique IP address that is not used by other network devices. (Example: 10.3.0.1)

5. Repeat this process and enter a unique IP address into each of the MVDS transmitters and receivers.

2.2.2 Configure via Web browser

After you have assigned the IP address for each MVDS transmitter and receiver, you can configure these devices using a PC with any standard web browser. For each MVDS transmitter and receiver, access the Web page using the IP address you have configured into the device. By default the user name is "root" and no password is set.

To view the IP address of the transmitter and the receivers, you can use the Admin Manager program.

Note

- When an IP address is set to the transmitter, it can be seen on the front panel.

TIP

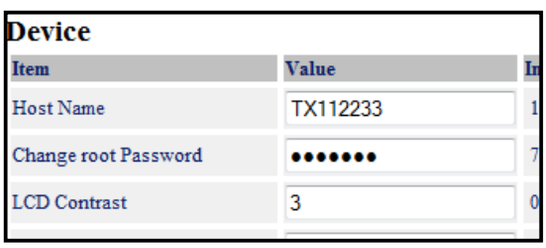
- Please note that the PC must be configured with a unique IP address that is compatible with the IP addresses used in the transmitters and receivers (for example, if the transmitter has an IP address of 169.254.3.111, the PC could have an IP address of 169.254.3.1, assuming that this address is not used by any of the receivers).

Host name / Password configuration

Configure Host Name and Password.

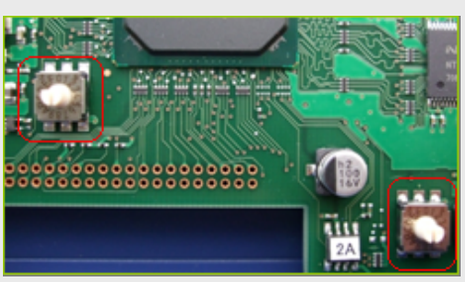
TIP

- Be sure to set a password, especially if you are using the MVDS with a public network.



In factory default, the last six hexadecimal digits of the Ethernet MAC address is used as the host name of the MVDS transmitter and receiver(s). You can change the host name if desired, but make sure that is a unique name.

In some cases, it is desirable to change this host name on the receivers using hardware switches (for example, to allow receivers to be deployed with preconfigured host name). The MVDS receiver has internal rotary switches that can be used to set a hexadecimal value for the host name (note that you must remove the cover of the enclosure to access these switches). The right switch is for the upper byte and left switch is for the lower byte of the host name. When set to 01-3E, the value is applied and set as host name at the time of power on. When set to 00, the value configured in the Web page is applied as the host name.



Value (hexadecimal)	Description
00h	This value is not used as a host name. The receiver will run with the host name configured through Web browser or TELNET.
01h - 3Eh	The string, "01" to "3E", will be used as a host name. This host name will be stored (overwritten) in internal memory as a setting value. Therefore, even if "00" is set again, the host name will not be reset to the previous name.
3Fh - FFh	Do not set these values as it may cause unstable operation. (As only 6bit out of 8bit can be recognized, the same host name may be used twice.)

Network configuration

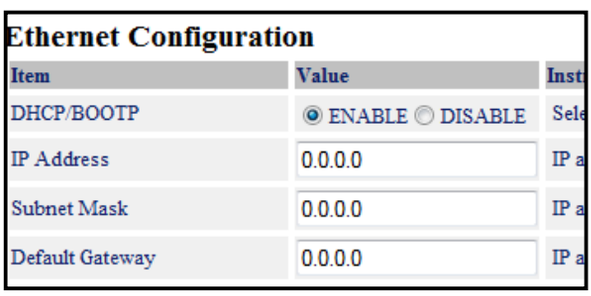
*** Required for both Transmitter and Receivers**

Configure the IP address and wireless settings. Select **Network** under **Configuration** in the Web page.

> **TIP**
> - The MVDS transmitter and receivers operate without the need to manually configure an IP address as they supports Auto IP function.
> - It is impossible to broadcast a movie across a router.

<DHCP, IP, Subnet, Gateway>

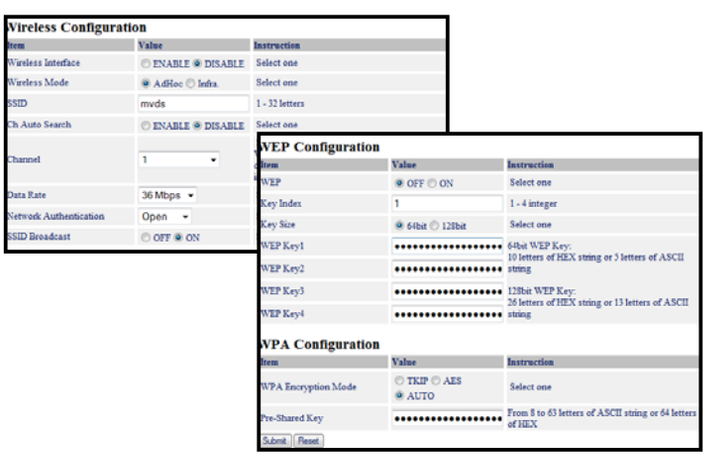
Configure these settings according to your network environment (by default, DHCP and the Auto IP function are enabled).



<Wireless>

Select **Enable** for the **Wireless Interface**. Select the options for **Wireless Mode**, **SSID**, **WEP**, etc. appropriate for your environment.

> **TIP**
> - Be sure to use WEP security, especially if you are using MVDS with a public wireless network.



Example: The following are the sample settings to use this product in AdHoc mode.

	Transmitter	Receiver
Interface	Enable	Enable
Mode	AdHoc	AdHoc
SSID	Optional	Optional (same as Transmitter)
Ch.AutoSearch	DISABLE	N/A
Channel	Optional	N/A
DataRate	36Mbps	36Mbps
Authentication	Open	Open
WEP	ON	ON
Key Index	1	1
Key Size	128bit	128bit
WEP Key1	Optional	Optional (same as Transmitter)

Adjusting a screen image (at transmitter)

Connect to the web page of the transmitter to adjust a screen image appropriate for the player.

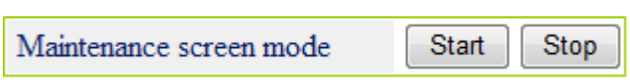
If you are sure of what value to set for screen image, click **Video/Audio/Data** under **Configuration** and configure each setting. If you are not sure what values to set, you can use the auto-adjustment feature to automatically adjust the screen image.

The use of the auto-adjustment function is described below:

1. Output a still image (white or any other light color) from the player.
2. You can use the default values, however, if you want to make better adjustment, access the Video/Audio/Data Configuration page by clicking **Video/Audio/Data** under **Configuration**, and enter the following values.

Gain	32
Offset	160
Filter	15

3. Select **Video/Audio** under **Tools** and click the **Start** button next to **Maintenance screen mode**. Click the **Stop** button to take effect.



4. Select **Video/Audio** under **Tools** and click the **Start** button next to **Video signal auto configuration**. Auto-adjustment will begin. If the video signal is not scanned correctly or an error occurs, configure it manually.

5. Click **Video/Audio/Data** under **Configuration** and adjust the settings such as PHASE_CC, etc. to make the image quality better.

Video Configuration

Item	Value	Instruction
Codec size(KB)	64	32 - 255 integer
Capture Timing	2	1 - 29 integer
Gain R	128	0 - 255 integer
Gain G	128	0 - 255 integer
Gain B	128	0 - 255 integer
Filter R	1	0 - 15 integer
Filter G	1	0 - 15 integer
Filter B	1	0 - 15 integer
Offset R	128	0 - 255 integer
Offset G	128	0 - 255 integer
Offset B	128	0 - 255 integer
H.Position	313	0 - 65535 integer
H Width	128	0 - 65535 integer
H Period	1664	0 - 65535 integer
V.Position	21	0 - 65535 integer
V Width	7	0 - 65535 integer
V Period	798	0 - 65535 integer
PLLGAIN_H	1	0 - 3 integer
PLLGAIN_L	6	0 - 7 integer
PLLDIV	1687	0 - 65535 integer
CLPDLY	8	0 - 255 integer
CLPDUR	32	0 - 255 integer
HSOPW	96	0 - 255 integer
SYNC_CTRL	64	0 - 255 integer
PHASE_CC	0	0 - 63 integer
H.Position Offset	50	0 - 100 integer
H.Width Offset	50	0 - 100 integer
H.Period Offset	50	0 - 100 integer
V.Position Offset	50	0 - 100 integer
V.Width Offset	50	0 - 100 integer
V.Period Offset	50	0 - 100 integer

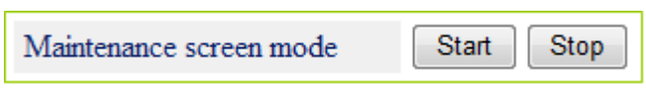
Adjusting a screen image (at receiver(s))

TIP

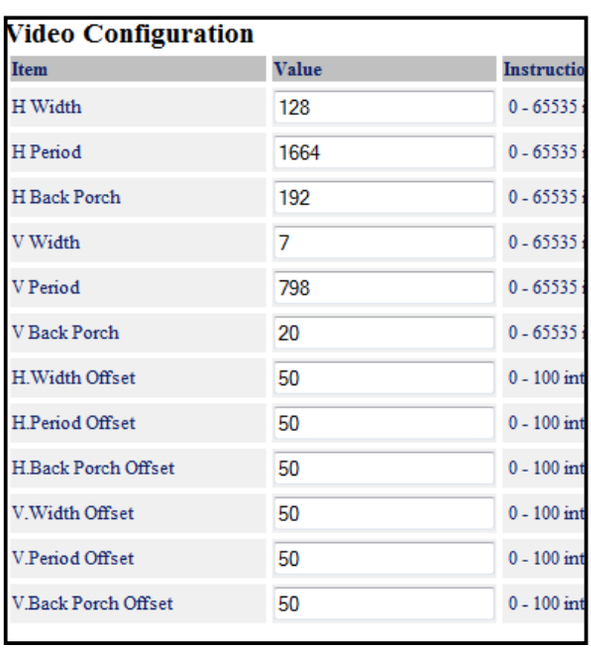
- You normally do not have to adjust a screen image at the receivers since the monitor will automatically make adjustments.

1. If adjustment is necessary, go to the Web page of the transmitter. Click **Video/Audio** under **Tools** and click the **Start** button next to **Maintenance screen mode** to switch to maintenance mode and output the maintenance screen to the receivers. The MVDS will automatically adjust the image quality and position, etc. of the monitor.

2. When the adjustment of the screen image for the monitor is complete, click **Stop** button to finish the maintenance mode.



3. If the adjustment does not go properly, click **Video/Audio/Data** under **Configuration** and configure each value manually.



Video Configuration

Item	Value	Instructio
H Width	128	0 - 65535
H Period	1664	0 - 65535
H Back Porch	192	0 - 65535
V Width	7	0 - 65535
V Period	798	0 - 65535
V Back Porch	20	0 - 65535
H.Width Offset	50	0 - 100 int
H.Period Offset	50	0 - 100 int
H.Back Porch Offset	50	0 - 100 int
V.Width Offset	50	0 - 100 int
V.Period Offset	50	0 - 100 int
V.Back Porch Offset	50	0 - 100 int

TIP

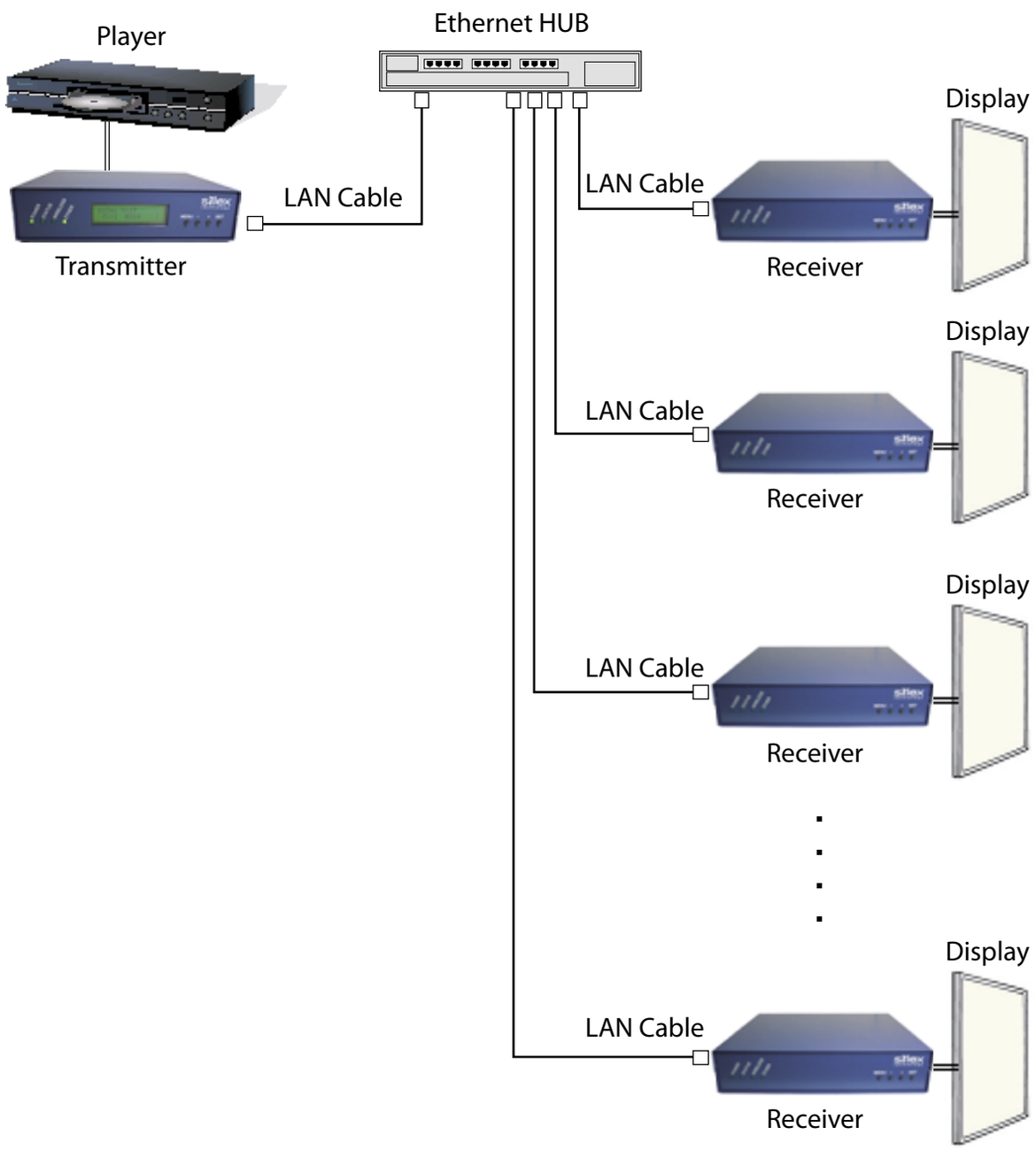
- Configure each parameter appropriate for your monitor. If incorrect parameters are set, the monitor may malfunction.

2.3 Hardware installation

2.3.1 Connect to a wired network

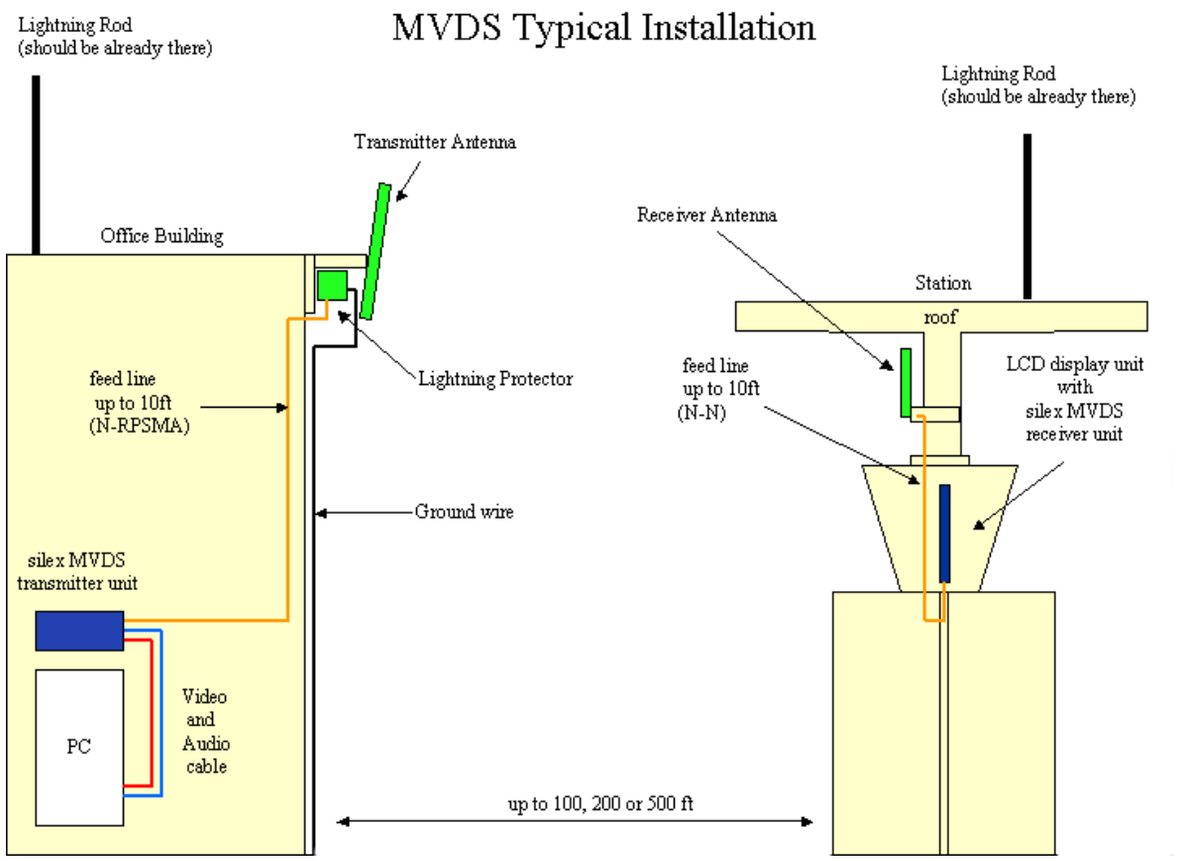
To configure this product in a wired network, connect the transmitter and receivers via Ethernet HUB.

Sample connection for wired network



2.3.2 Connect to a wireless network

Below is a sample connection to install this product outdoors.

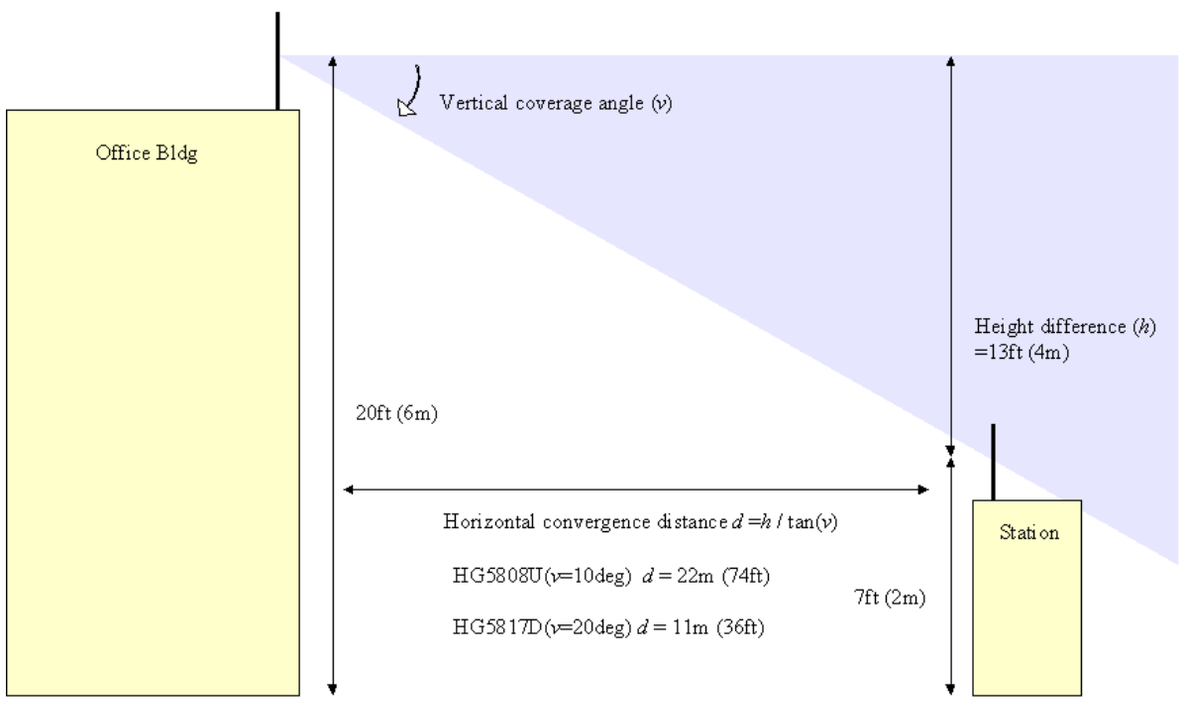


Select the antenna according to your location status, distance from the receiver or layout.

Vertical convergence angle and minimum distance

Every 'high-gain' antenna has vertical and horizontal selectiveness. The narrower the coverage, the higher the possible gain. However, this selectiveness also creates 'blind spot' in close range, especially if antennas located in different height.

Vertical convergence angle and minimum distance

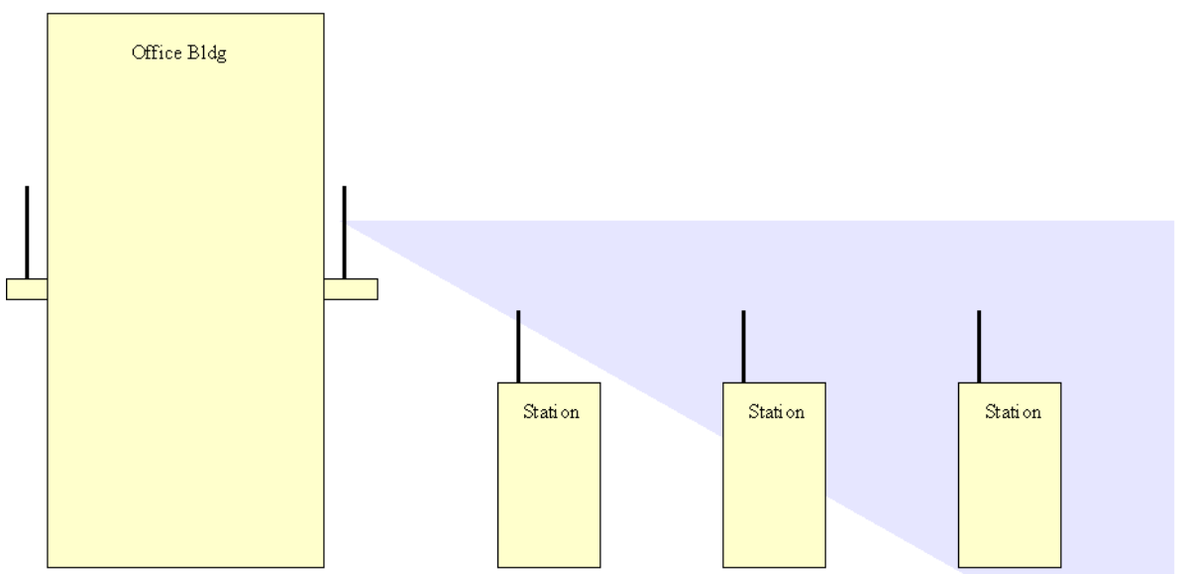


Vertical coverage and Line-of-sight

From a vertical convergence point of view, less height difference is better to minimize distance problems. However, it also creates more Non-Line-Of-Sight (NLOS) problems.

In this diagram, the other side of the office building could not covered by single TX antenna, so another TX set needs to be provided if there are other stations there.

Vertical coverage and Line-of-sight



3

Monitor and Maintenance

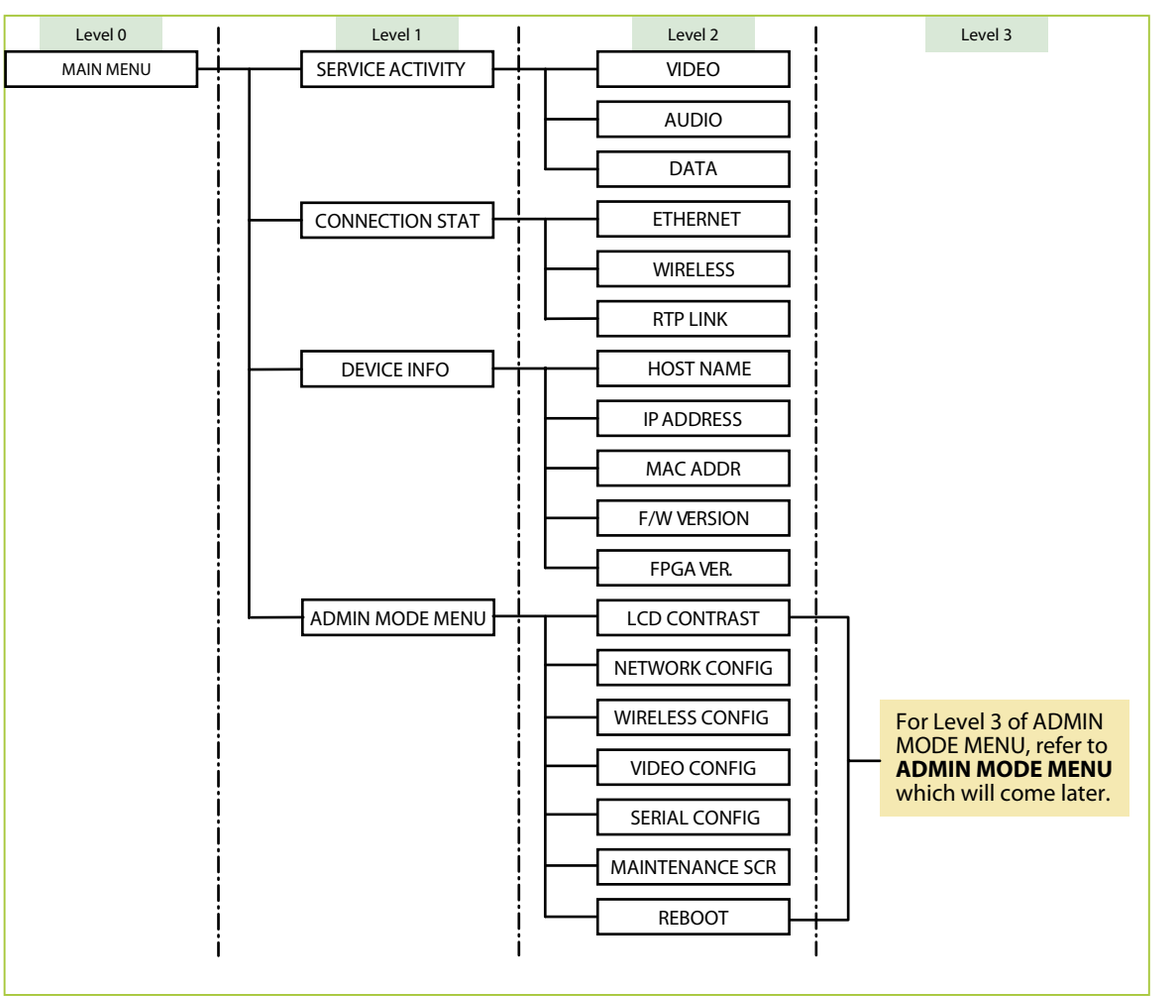
3.1 Front panel

The MVDS transmitter has a LCD which provides the operating status and configuration for transmitters.

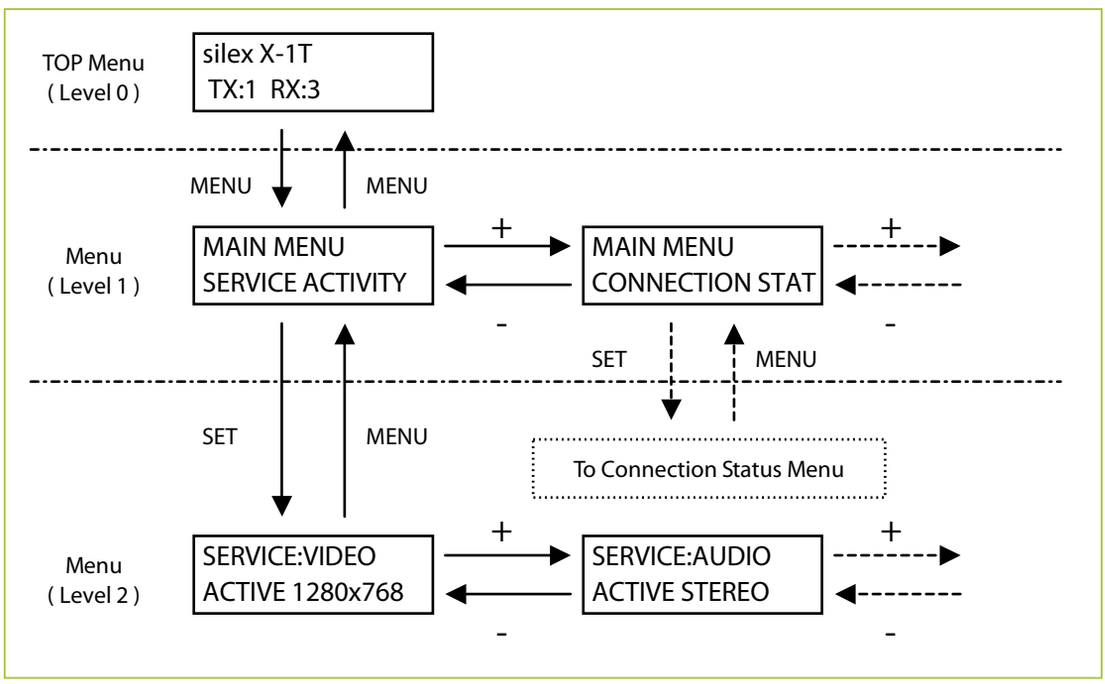
Use the push buttons to the right of LCD (**MENU**, **-**, **+**, **SET**) to switch the panel menu as well as change the settings.

3.1.1 Menu structure and how to use it

The LCD menu has the structure below. "Level 0-3" at the top of this diagram indicate the hierarchy level.



Each menu can be switched by pushing the push buttons to the right of LCD. To switch the menu levels, use [**MENU**] and [**SET**] buttons. To switch the options in the same level, use [**+**] and [**-**] buttons. The menu transition diagram is as below.



In each menu, if no push buttons are pushed for a certain period, the LCD menu automatically returns to the initial screen. The amount of time before the LCD menu returns to the initial screen can be configured from the Wep page by changing a value at **Menu idle timeout**.

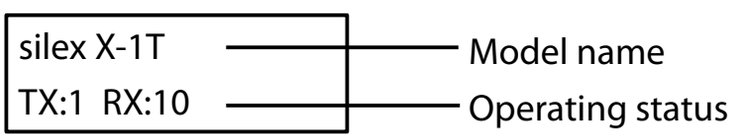
3.1.2 Functions available in each menu

This section explains the functions available in LCD menu.

Initial screen (Level:0)

This screen is always displayed while this product is turned on. When this product is running properly, the model name and operating status are shown in the upper line and lower line respectively. When an error occurs or the firmware of this product is being updated, operating status is displayed in both upper and lower lines.

Initial screen (sample)



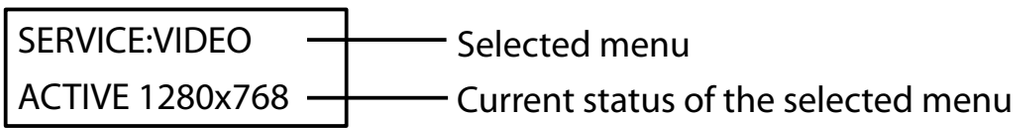
Operating status

Upper line	Operating status	Lower line	Details
(Model name)	Operating normally	TX:** RX:****	Normal status The number of transmitters and receivers being connected is displayed.
		Please wait...	Processing MVDS boot.
		*** REBOOTING ***	Rebooting Displayed when rebooted via Web page, Telnet or LCD panel.
NO VGA SIGNAL!	Error	(None)	No VGA signal is input. Check the connection between the player(s) and this product.
Out of range		V **Hz or H **kHz	Incorrect VGA signal The frequency of the input signal is displayed in the lower line. Refresh note error: V **Hz Resolution error: H **kHz Please check the output settings of player.
** F/W UPDATE**	Updating firmware	EEPROM ERASE....	Deleting an old firmware.
		>>>>*	Writing a new firmware. The progress is displayed.
		CHK-SUM:XXXX OK!	Succeeded in the firmware update.
		CHECKSUM ERROR!	Failed in the firmware update.

SERVICE ACTIVITY

Shows the service status for each data transfer.

SERVICE ACTIVITY (sample)



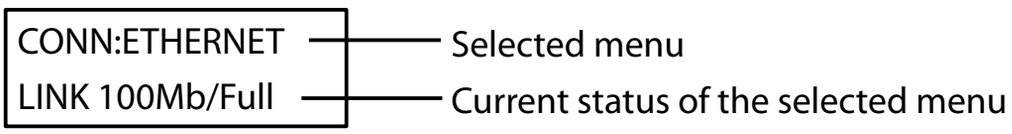
Menu options and status

Menu	Description	Status	Definition
VIDEO	Displays a service status for video data transfer.	ACTIVE ****x***	Video data is being transferred. The detected resolution is also displayed.
		NO SIGNAL	No video data is input.
AUDIO	Displays the service status for audio data transfer.	ACTIVE STEREO	Audio data is being transferred.
		WAIT VIDEO SYNC	Waiting for synchronization with video data.
SERIAL	Displays the service status for serial data transfer.	READY	Serial data transfer is ready.
		ACTIVE	Serial data has been transferred.

CONNECTION STAT

Shows a network status.

CONNECTION STAT (sample)



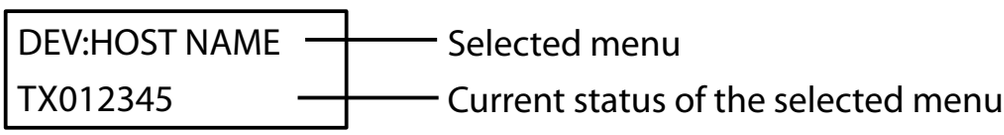
Menu options and status

Menu	Description	Status	Definition
ETHERNET	Show the Ethernet link status.	LINK 100Mb/Full	Communicating via a wired network. The link speed is also displayed.
		LINK 100Mb/Half	
		LINK 10Mb/Full	
		LINK 10Mb/Half	
		NOT CONNECTED	Cable is not connected.
WIRELESS	Show a wireless link status.	CONNECTED CH:**	Communicating wirelessly. The current channel is also displayed.
		NOT CONNECTED	The wireless connection is not established for being out of service area or incorrect encryption key.
		NOT AVAILABLE	The wireless communication is not available since a wireless card is not detected.
		DISABLED	The wireless communication is disabled by the settings.
RTP LINK	Show the link status in RTP level.	** CLIENT(S)	The number of receivers in the group is displayed.
		NOT CONNECTED	There are no transmitter or receivers in the group.

DEVICE INFO

Shows the device information.

DEVICE INFO (sample)

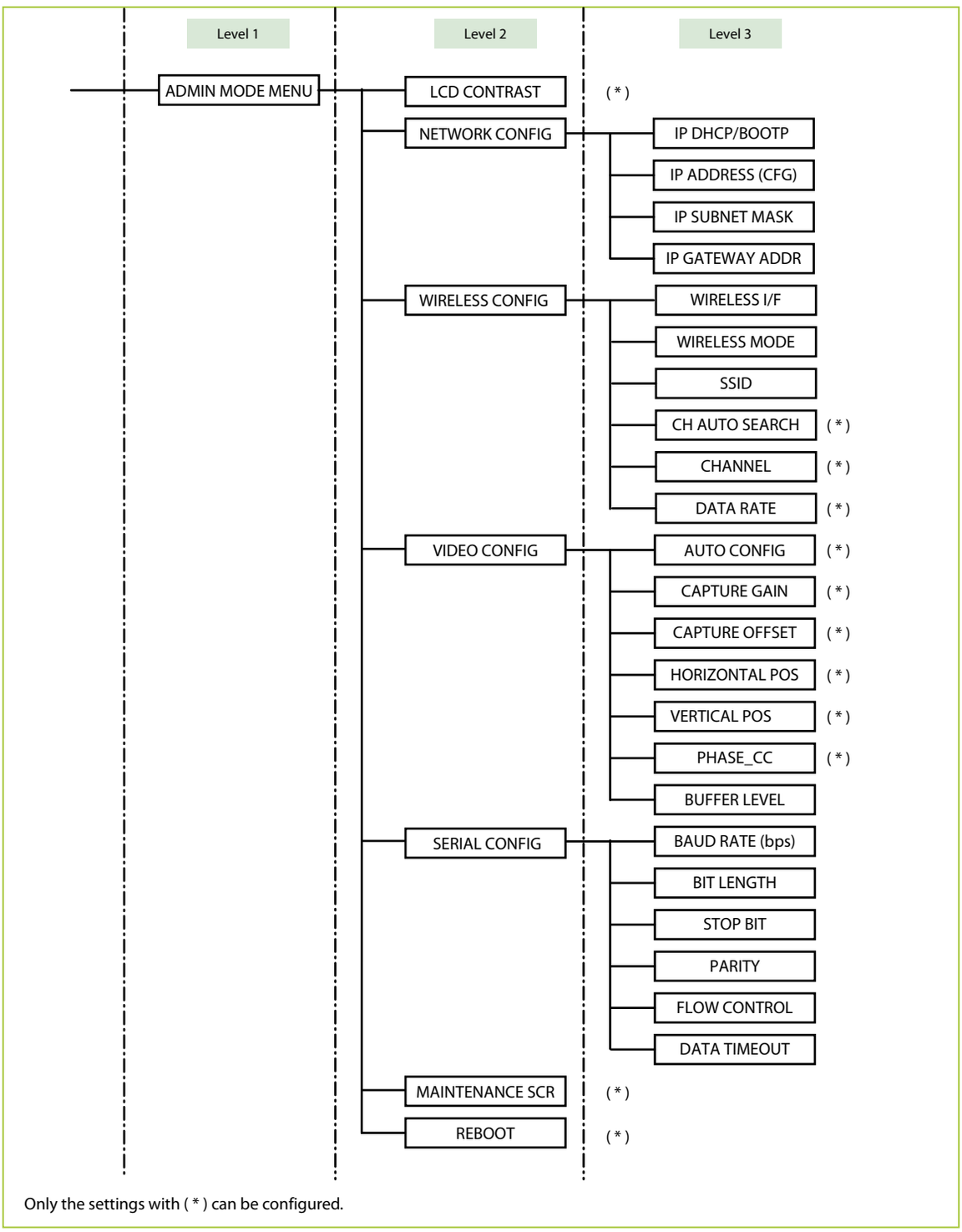


Menu options and status

Menu	Information displayed in the lower line
HOST NAME	Show the host name.
IP ADDRESS	Show the IP Address.
MAC ADDR	Show the Mac Address.
F/W VERSION	Show the firmware version.
FPGA VER.	Show the FPGA version.

ADMIN MODE MENU

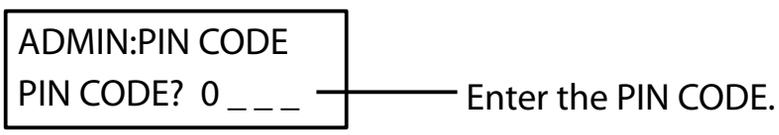
Part of settings can be configured, referred and maintained through ADMIN MODE MENU. This menu has a hierarchic structure below.



Only the settings with (*) can be configured.

To enter into LEVEL2 in ADMIN MODE MENU, the PIN CODE is required (In the factory default setting, the PIN CODE is "0000").

PIN CODE entry screen



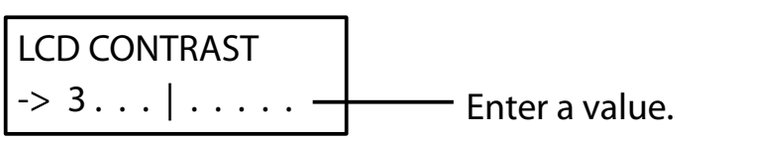
To enter the PIN CODE, select each number by pushing [**+**] and [**-**] buttons and save it by pushing [**SET**] button. If a correct PIN CODE is entered, configuration menus are displayed. If a wrong PIN CODE is entered, the error message, "**WRONG PIN CODE!**" is displayed and the LCD menu returns to LEVEL 1.

Each configuration menu in ADMIN MODE MENU are explained as follows.

LCD CONTRAST

Sets a contrast for LCD.

LCD CONTRAST screen

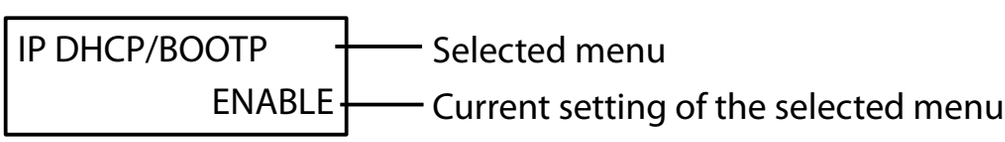


Select the value by pushing [**+**] and [**-**] buttons and determine it by pushing [**SET**] button.

NETWORK CONFIG

Configures the network settings.

NETWORK CONFIG (sample)

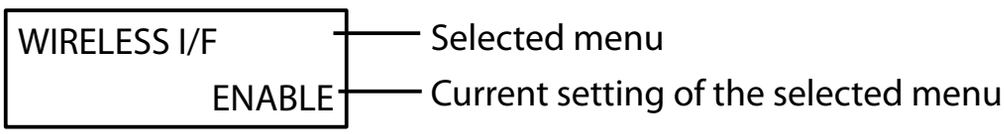


Menu	Information
IP DHCP/BOOTP	Displays whether DHCP/BOOTP are enabled or disabled.
IP ADDRESS(CFG)	Displays an IP Address.
IP SUBNET ADDR	Diplays a Subnet Mask.
IP GATEWAY ADDR	Displays a Default Gateway Address.

WIRELESS CONFIG

Shows or Changes the wireless LAN settings.

WIRELESS CONFIG (sample)

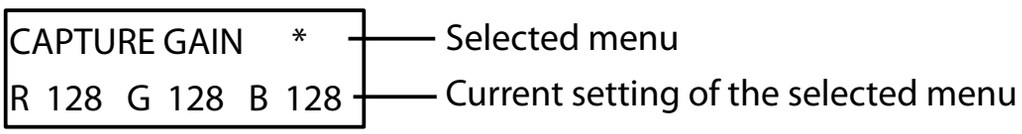


Menu	Information
WIREIESS I/F	Displays whether the wireless LAN setting is enabled or disabled.
WIRELESS MODE	Displays a wireless LAN mode (AdHoc/Infra.).
SSID	Displays the SSID.
CH AUTO SEARCH	Displays or Enables/Disables the channel auto-search function setting. You can switch to the configuration screen by pushing [**SET**] button. CH AUTO SEARCH * -> DISABLE ← Enter a value. Select [**ENABLE**] or [**DISABLE**] by pushing [**+**] and [**-**] buttons and save it by pushing [**SET**] button. * Reboot this product to take effect.
CHANNEL	Displays or Configures the wireless channel for Ad hoc mode. You can switch to the configuration screen by pushing [**SET**] button. CHANNEL * -> 1 ← Enter a value. Select a channel by pushing [**+**] and [**-**] buttons and save it by pushing [**SET**] button. * Reboot this product to take effect.
DATA RATE	Displays or Configures a transmission dit rate for wireless LAN. DATA RATE * -> 36 Mbps ← Enter a value. Select a value by pushing [**+**] and [**-**] buttons and save it by pushing [**SET**] button. * Reboot this product to take effect.

VIDEO CONFIG

Shows or Configures the video settings.

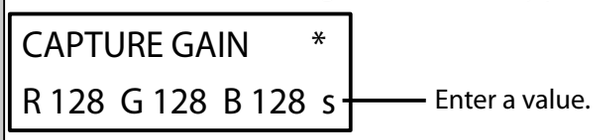
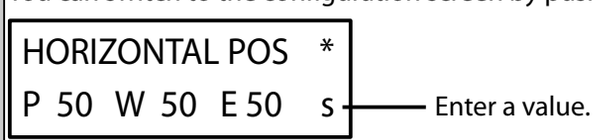
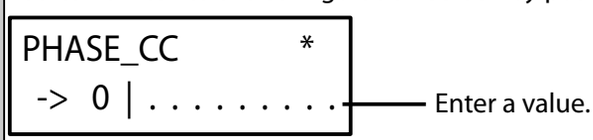
VIDEO CONFIG (sample)



Menu	Information
AUTO CONFIG	Starts the auto-adjustment for image parameters. By pushing [**SET**] button, you can switch to the auto-adjustment screen. Push [**+**] and [**-**] buttons to select [**OK**] (the current setting is enclosed with [ ]). Push [**SET**] button to start auto-adjustment. VGA CONFIG CANCEL [OK] ← Select [**OK**]. The result is displayed in the lower line of LCD. The definition of each message is as follows:

Message	Status
COMPLETE & SAVED	Suceeded in VGA auto-adjustment.
ERR: OUT RANGE	Failed in VGA auto-adjustment. Incorrect VGA signal is input. Check that the resolution and refresh note settings are respectively set to "1280x768" and "60Hz" in the player(s).
ERR: NO VGA IN	Failed in VGA auto-adjustment. VGA signal is not input. Check that a VGA cable is properly plugged in or player(s) have proper settings to output video signals.
ERR: SCAN FAILED	Failed in VGA auto-adjustment. Play another movie or still image at the player(s) and try the auto-adjustment again.
ERR: N/A	VGA auto-adjustment unavailable VGA auto-adjustment is not available while this product is sending a maintenance screen. Stop sending a maintenance screen and try the auto-adjustment again.

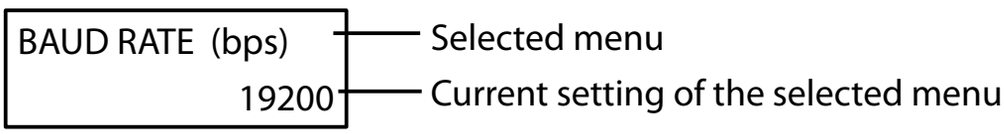
VIDEO CONFIG

Menu	Information
CAPTURE GAIN	Displays or Configures the Gain value (R/G/B). You can switch to the configuration screen by pushing [**SET**] button.  Set the value in the order of **R** -> **G** -> **B**. Select a value by pushing [**+**] and [**-**] buttons and determine it by pushing [**SET**] button. When one value is determined, the cursor will move to the other. When the cursor came to "**s**", push [**SET**] button to save the settings.
CAPTURE OFFSET	Displays or Configures the Offset value (R/G/B). You can switch to the configuration screen by pushing [**SET**] button.  Set the value in the order of **R** -> **G** -> **B**. Select a value by pushing [**+**] and [**-**] buttons and determine it by pushing [**SET**] button. When one value is determined, the cursor will move to the other. When the cursor came to "**s**", push [**SET**] button to save the settings.
HORIZONTAL POS	Displays or Configures the horizontal position (P: Position, W: Width, E: Period) settings. You can switch to the configuration screen by pushing [**SET**] button.  Set the value in the order of **Position** -> **Width** -> **Period**. Each can be a value from 0 to 100, with 50 being the center, less than 50 being minus, and greater than 50 being plus. Select a value by pushing [**+**] and [**-**] buttons and determine it by pushing [**SET**] button. When one value is determined, the cursor will move to the other. When the cursor came to "**s**", push [**SET**] button to save the settings.
PHASE_CC	Displays or Configures the PHASE_CC settings. You can switch to the configuration screen by pushing [**SET**] button.  Select a value by pushing [**+**] and [**-**] buttons and save it by pushing [**SET**] button.
BUFFER LEVEL	Displays the value for retransmission buffer.

SERIAL CONFIG

Shows the serial settings.

SERIAL CONFIG (sample)



Menu	Information
BAUD RATE (bps)	Displays a baudrate.
BIT LENGTH	Displays a bit length.
STOP BIT	Displays a stop bit.
PARITY	Displays a parity bit.
FLOW CONTROL	Displays a flow control setting.
DATA TIMEOUT	Displays a serial input timeout setting.

MAINTENANCE SCR

Sends or Stops a maintenace screen.

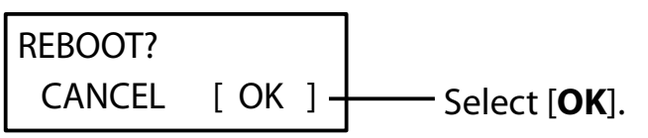
MAINTENANCE SCR screen

Push [**+**] and [**-**] buttons to select [**START**] or [**STOP**] (the current setting is enclosed with [ ]).
Push [**SET**] button to send or stop the maintenance screen data.

REBOOT

Reboots this product.

REBOOT screen



Push [**+**] and [**-**] buttons to select [**OK**] (the current setting is enclosed with [ ]).
Push [**SET**] button to reboot this product.

3.2 Web interface

Configure using a Web browser

Since this product implements HTTP protocol, advanced settings for this product can be configured or changed using a Web browser. Also, a convenient function such as a remote reboot is available.

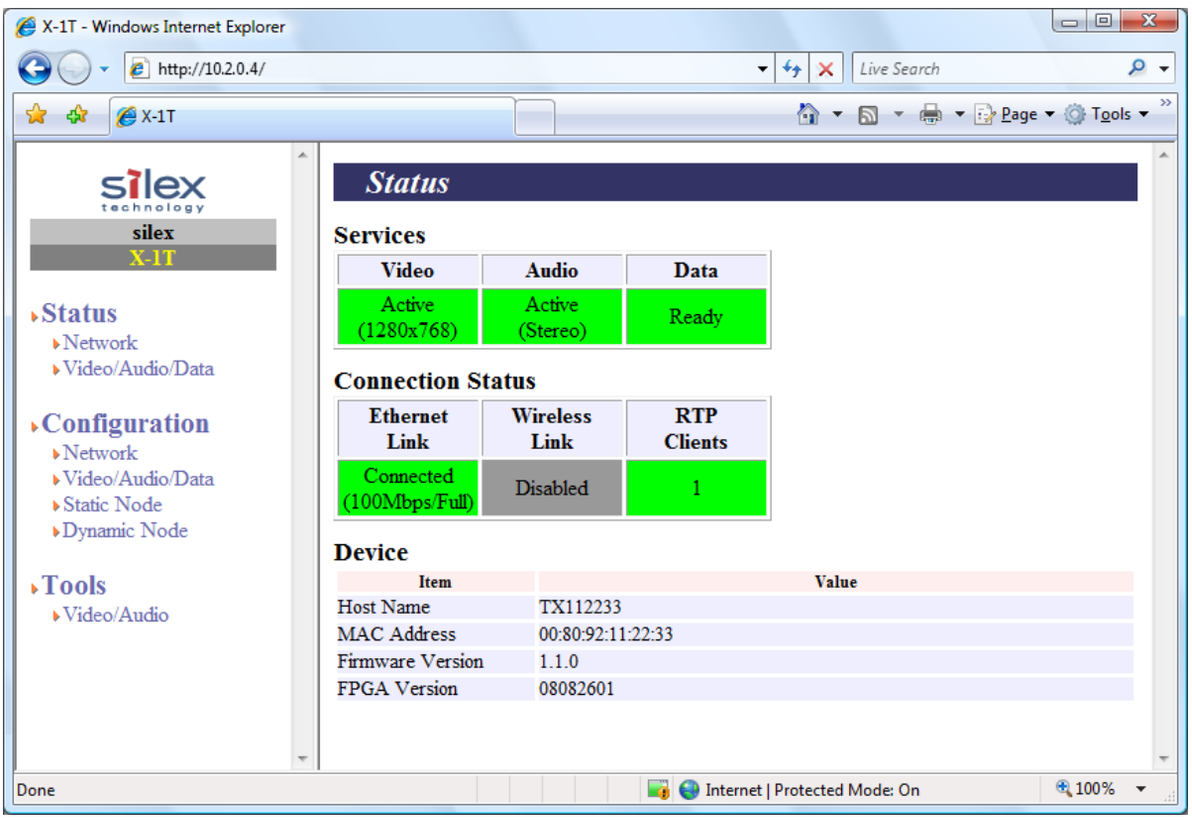
TIP

- To use a Web browser, the TCP/IP settings need to be enabled, and an IP address needs to be configured to this product.
- We recommend a Web browser below.
  Microsoft Internet Explorer 6.0 or later
- The explanation below is an example when using Internet Explorer in a Windows Vista environment. Actual screens may vary depending on your Web browser.

Display the Web page

To access the Web page of this product, enter the IP address of this product into the address bar of the Web browser and press the **ENTER** key.

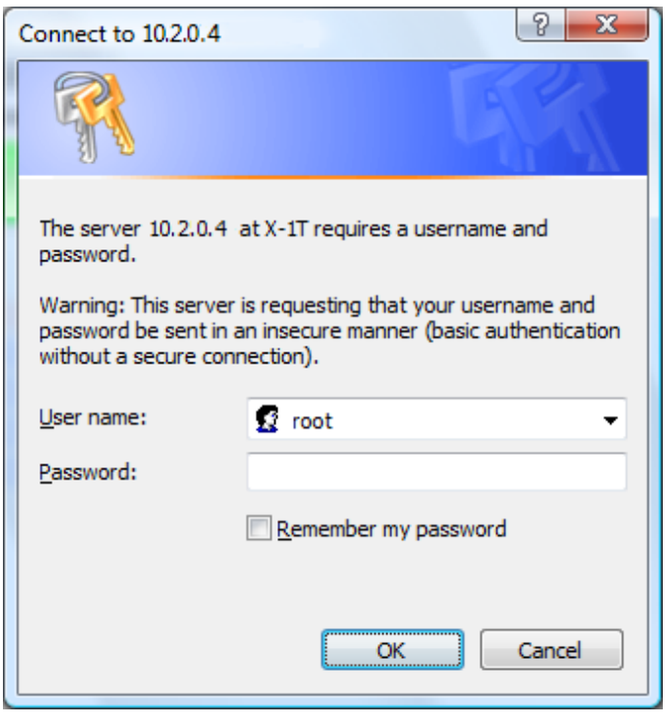
Example: http://10.2.0.4/



Configure from the Web page

Click the menu item that you wish to configure. When the screen below is displayed, type a user name (root) and password, then click **OK**.

In the factory default settings, no password is set.

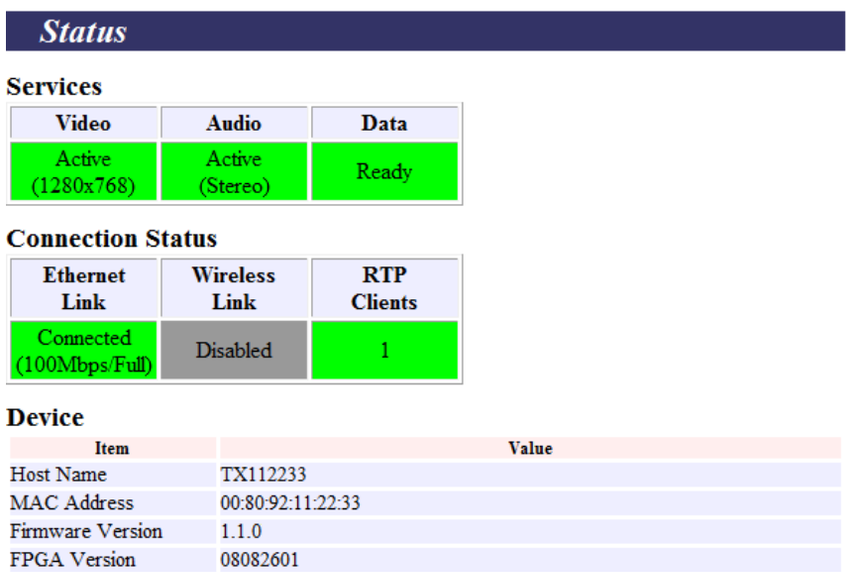


3.2.1 Status

Operating status for each audio, video and serial port is displayed.

General

Displays general status for each audio, video and serial port.



Status

Services

Video	Audio	Data
Active (1280x768)	Active (Stereo)	Ready

Connection Status

Ethernet Link	Wireless Link	RTP Clients
Connected (100Mbps/Full)	Disabled	1

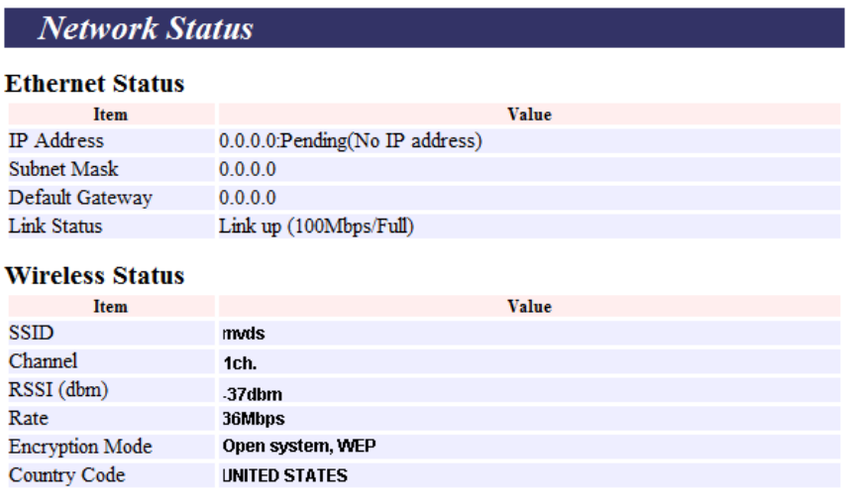
Device

Item	Value
Host Name	TX112233
MAC Address	00:80:92:11:22:33
Firmware Version	1.1.0
FPGA Version	08082601

	Name	Details
Services	Video	Display a transfer status for video data.
	Audio	Display a transfer status for audio data.
	Data	Display a transfer status for serial data.
Connection	Status Ethernet Link	Display a wired connection status and link speed.
	Wireless Link	Display the wireless connection status and channel number. (Receiver only) Display a signal strength by dbm.
	RTP Clients	(Receiver only) Display a number of receivers.
	RTP Server Name	(Receiver only) Display a host name of transmitter.
Device	Host Name	Display a host name.
	MAC Address	Display the MAC Address.
	Firmware Version	Display a firmware version.
	FPGA Version	Display the FPGA version.

Network

Displays current network status (IP Address and wireless).



Network Status

Ethernet Status

Item	Value
IP Address	0.0.0.0:Pending(No IP address)
Subnet Mask	0.0.0.0
Default Gateway	0.0.0.0
Link Status	Link up (100Mbps/Full)

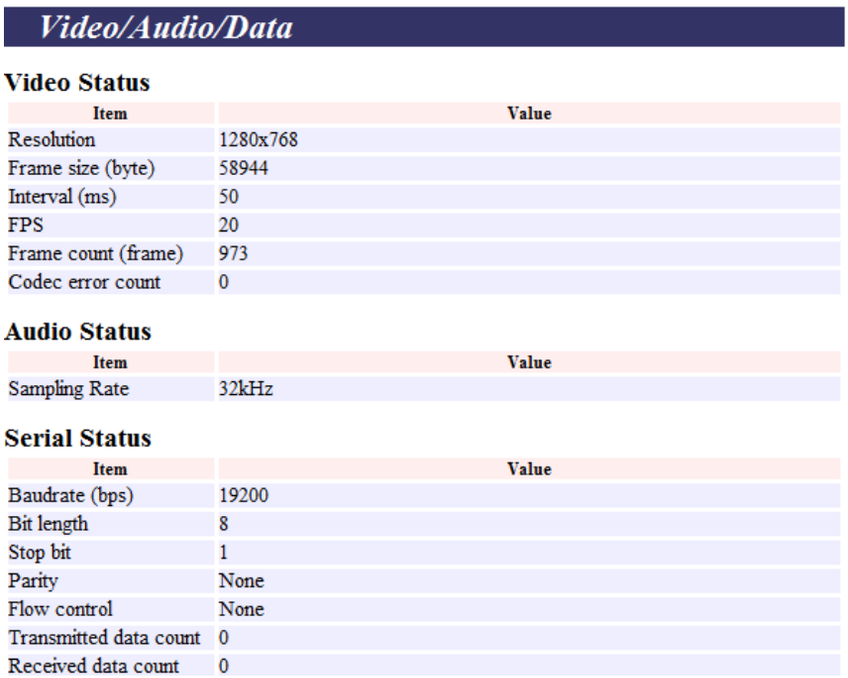
Wireless Status

Item	Value
SSID	mwds
Channel	1ch.
RSSI (dbm)	-37dbm
Rate	36Mbps
Encryption Mode	Open system, WEP
Country Code	UNITED STATES

	Name	Details
Ethernet Status	IP Address	Display an IP address.
	Subnet Mask	Display a subnet mask.
	Default Gateway	Display a default gateway address.
	Link Status	Display a link status.
Wireless Status	SSID	Display SSID of the wireless network which this product is connected to.
	Channel	Display a current channel number.
	RSSI (dbm)	Display a signal strength.
	Rate	Display a transmission data rate.
	Encryption Mode	Display the encryption mode being used. Blank when no connection is made.
	Country Code	Display a country code. Available wireless bands differ depending on the destination country.

Video/Audio/Data

Displays status for each audio, video and serial port.



Video/Audio/Data

Video Status

Item	Value
Resolution	1280x768
Frame size (byte)	58944
Interval (ms)	50
FPS	20
Frame count (frame)	973
Codec error count	0

Audio Status

Item	Value
Sampling Rate	32kHz

Serial Status

Item	Value
Baudrate (bps)	19200
Bit length	8
Stop bit	1
Parity	None
Flow control	None
Transmitted data count	0
Received data count	0

	Name	Details
Video Status	Resolution	Display a capture resolution.
	Frame size (byte)	Display a data size of the last frame.
	Interval (ms)	Display a capture interval.
	FPS	Display a frame rate.
	Frame count (frame)	Display a number of the captured frame.
	Codec error count	Display a number of codec error (the errors notified from codec chip).
	Frame lost count	(Receiver only) Display a number of frame that could not be captured.
Audio Status	Sampling Rate	Display PCM sampling rate.
	Data lost count	(Receiver only) Display a number of data that could not be received.
Serial Status	Baudrate (bps)	Display a baudrate.
	Bit length	Display a bit length.
	Stop bit	Display a stop bit.
	Parity	Display a parity bit.
	Flow control	Display a flow control.
	Transmitted data count	Display a number of transmitted data.
	Received data count	Display a number of received data.

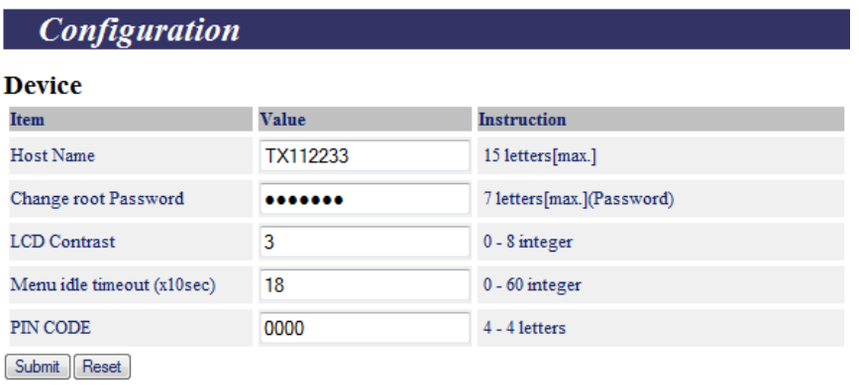
3.2.2 Configuration

Configure the network settings and transmission conditions for audio, video and serial port.

Click the item that you wish to configure. Select an option or enter a value and click **Submit**.

General

Common settings for Transmitter and Receivers. Configure a host name and password.



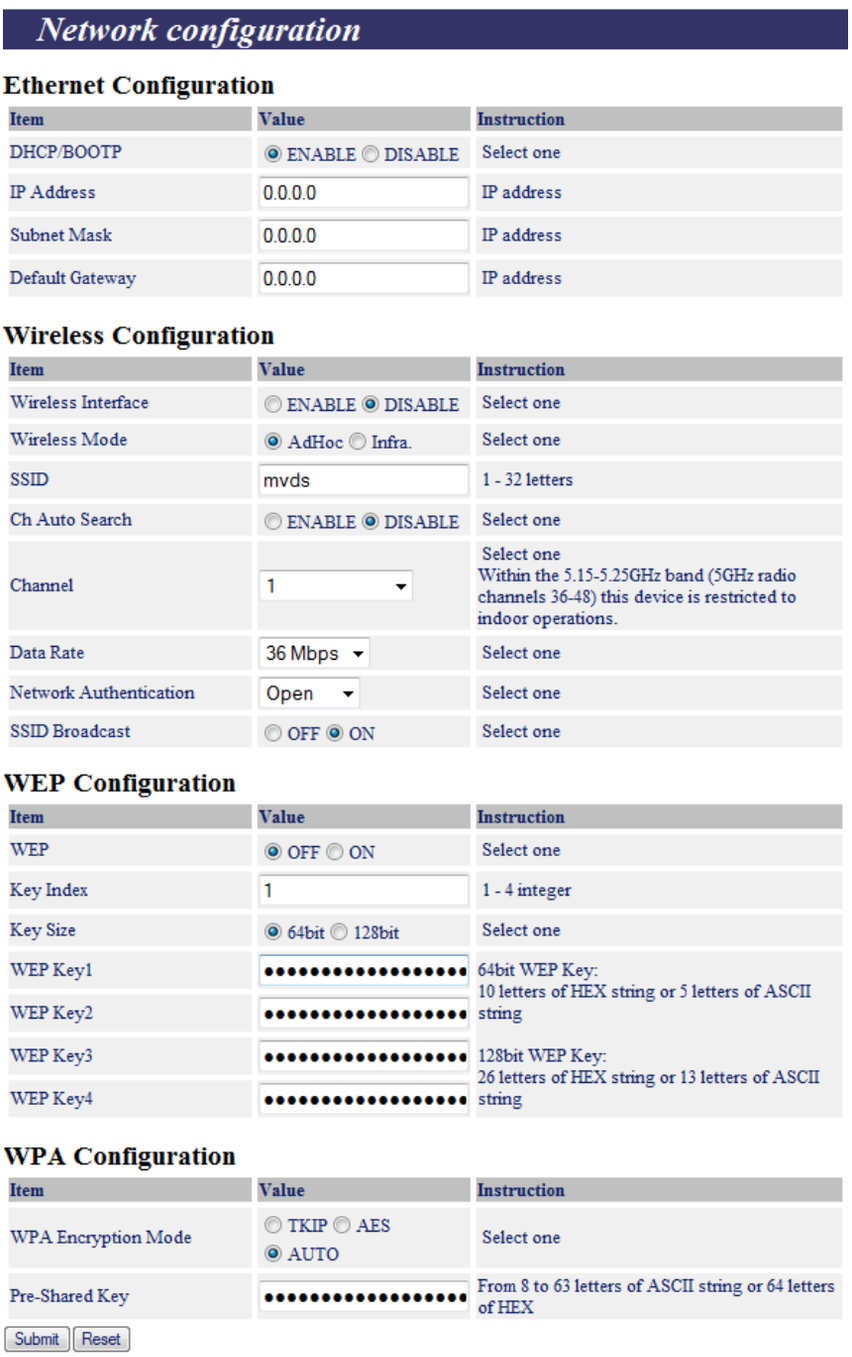
	Name	Details
Device	Host Name	Set a host name.
	Change root Password	Set passwords for Web and Telnet.
	LCD Contrast	Set a contrast for LCD.
	Menu idle timeout	Set the amount of time before the LCD menu returns to the initial screen when it is idle.
	PIN CODE	Set a PIN CODE to limit an access to LCD menu configuration.

TIP

- Be sure to set a password, especially if you are using the MVDS with a public network.

Network

Configures the network settings.



Network configuration

Ethernet Configuration

Item	Value	Instruction
DHCP/BOOTP	(•) ENABLE ( ) DISABLE	Select one
IP Address	0.0.0.0	IP address
Subnet Mask	0.0.0.0	IP address
Default Gateway	0.0.0.0	IP address

Wireless Configuration

Item	Value	Instruction
Wireless Interface	( ) ENABLE (•) DISABLE	Select one
Wireless Mode	(•) AdHoc ( ) Infra.	Select one
SSID	mvds	1 - 32 letters
Ch Auto Search	( ) ENABLE (•) DISABLE	Select one
Channel	1	Select one Within the 5.15-5.25GHz band (5GHz radio channels 36-48) this device is restricted to indoor operations.
Data Rate	36 Mbps	Select one
Network Authentication	Open	Select one
SSID Broadcast	( ) OFF (•) ON	Select one

WEP Configuration

Item	Value	Instruction
WEP	(•) OFF ( ) ON	Select one
Key Index	1	1 - 4 integer
Key Size	(•) 64bit ( ) 128bit	Select one
WEP Key1	••••••••••••••••••	64bit WEP Key: 10 letters of HEX string or 5 letters of ASCII string
WEP Key2	••••••••••••••••••	
WEP Key3	••••••••••••••••••	128bit WEP Key: 26 letters of HEX string or 13 letters of ASCII string
WEP Key4	••••••••••••••••••	

WPA Configuration

Item	Value	Instruction
WPA Encryption Mode	( ) TKIP ( ) AES (•) AUTO	Select one
Pre-Shared Key	••••••••••••••••••	From 8 to 63 letters of ASCII string or 64 letters of HEX

Submit Reset

	Name	Details
Ethernet Configuration	DHCP/BOOTP	Enable/Disable a DHCP function.
	IP Address	Set an IP Address.
	Subnet Mask	Set a Subnet Mask.
	Default Gateway	Set a Default Gateway.
Wireless Configuration	Wireless Interface	Enable/Disable the wireless.
	Wireless Mode	Select the wireless connection mode.
	SSID	Specify the SSID.
	Ch Auto Search	(Transmitter only) Enable/Disable the function to search for an available channel automatically.
	Channel	(Transmitter only) Specify a channel to use.
	Data Rate	Specify a transmission bit rate.
	Network Authentication	Specify an authentication method.
	SSID Broadcast	(Receiver only) Enable/Disable SSID broadcast. If this setting is disabled, this product will not be searched by other PCs over a wireless network. It allows to limit an access to MVDS network.
WEP Configuration	WEP	Enable/Disable the WEP.
	Key Index	Specify an index number for WEP key.
	Key Size	Specify a key length for WEP key.
	WEP Key1	Specify the WEP key (index number:1).
	WEP Key2	Specify the WEP key (index number:2).
	WEP Key3	Specify the WEP key (index number:3).
	WEP Key4	Specify the WEP key (index number:4).
WPA Configuration	WEP Encryption Mode	Select an encryption mode of WPA.
	Pre-Shared Key	Specify the Pre-Shared Key.

Video/Audio/Data (at transmitter)

Configures the video signal parameters, serial port and buffer size of transmitter.

Video/Audio/Data Configuration

Video Configuration

Item	Value	Instruction
Codec size(KB)	64	32 - 255 integer
Capture Timing	2	1 - 29 integer
Gain R	128	0 - 255 integer
Gain G	128	0 - 255 integer
Gain B	128	0 - 255 integer
Filter R	1	0 - 15 integer
Filter G	1	0 - 15 integer
Filter B	1	0 - 15 integer
Offset R	128	0 - 255 integer
Offset G	128	0 - 255 integer
Offset B	128	0 - 255 integer
H.Position	313	0 - 65535 integer
H Width	128	0 - 65535 integer
H Period	1664	0 - 65535 integer
V.Position	21	0 - 65535 integer
V Width	7	0 - 65535 integer
V Period	798	0 - 65535 integer
PLLGAIN_H	1	0 - 3 integer
PLLGAIN_L	6	0 - 7 integer
PLLDIV	1687	0 - 65535 integer
CLPDLY	8	0 - 255 integer
CLPDUR	32	0 - 255 integer
HSOPW	96	0 - 255 integer
SYNC_CTRL	64	0 - 255 integer
PHASE_CC	0	0 - 63 integer
H.Position Offset	50	0 - 100 integer
H.Width Offset	50	0 - 100 integer
H.Period Offset	50	0 - 100 integer
V.Position Offset	50	0 - 100 integer
V.Width Offset	50	0 - 100 integer
V.Period Offset	50	0 - 100 integer

Serial Configuration

Item	Value	Instruction
Baudrate (bps)	19200	Select one
Bit length	8 7	Select one
Stop bit	1 2	Select one
Parity	NONE ODD EVEN	Select one
Flow control	NONE XON/XOFF RTS/CTS	Select one
Data timeout	100	50 - 1000 integer

Buffer

Item	Value	Instruction
Buffering Level	64	5 - 64 integer

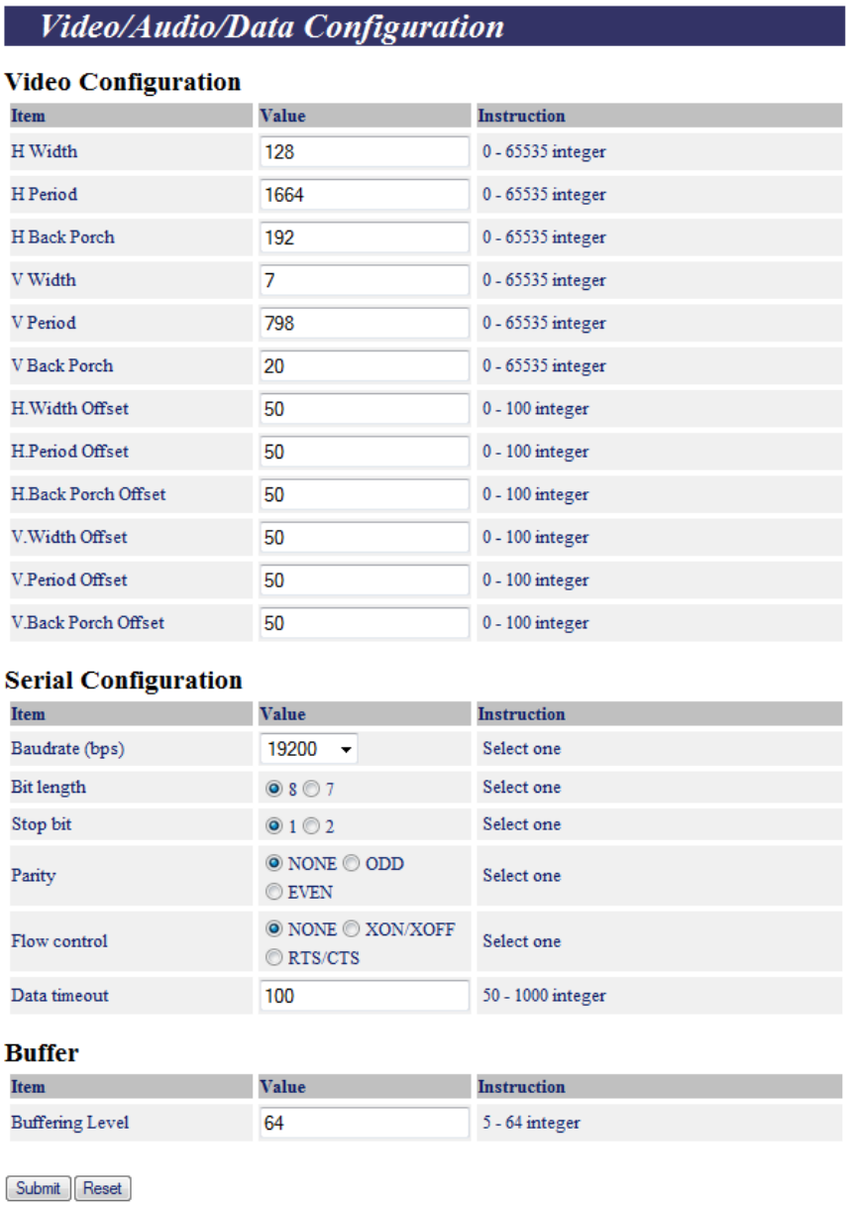
Submit Reset

	Name	Details
Video Configuration	Capture Timing	Vertical frequency / (1+x) = FPS Example: 60[Hz]/(1+[capture timing]2)= 20[fps]
	Gain R	Adjust a red gain.
	Gain G	Adjust a green gain.
	Gain B	Adjust a blue gain.
	Filter R	Adjust a red filter.
	Filter G	Adjust a green filter.
	Filter B	Adjust a blue filter.
	Offset R	Adjust a red offset.
	Offset G	Adjust a green offset.
	Offset B	Adjust a blue offset.
	H.Position	Specify a horizontal position.
	H Width	Specify a width of horizontal synchronization signal by dot clock.
	H Period	Specify a period for horizontal synchronization by dot clock.
	V.Position	Specify a vertical position.
	V Width	Specify a width of vertical synchronization signal by horizontal synchronization signal.
	V Period	Specify a period for vertical synchronization signal by horizontal synchronization signal.
	PLLGAIN_H	Specify the PLLGAIN VCO Range.
	PLLGAIN_L	Specify the PLLGAIN Charge Pump Current.
	PLLDIV	Specify the ADC PLL Divider ratio. Usually, equivalent to the value of H.Period minus one.
	CLPDLY	Specify the Clamp Pulse Delay.
	CLPDUR	Specify the Clamp Pulse width.
	HSOPW	Specify a pulse width of ADC HSOUT.
	SYNC_CTRL	Perform a synchronization control.
	PHASE_CC	Specify the PHASE for image sampling.

	Name	Details
Video Configuration	H.Position Offset	Displays the offset value for H.Position setting that you may have configured from LCD menu. This value is added to H.Position setting and then take effect in the video image.
	H.Width Offset	Displays the offset value for H.Width setting that you may have configured from LCD menu. This value is added to H.Width setting and then take effect in the video image.
	H.Period Offset	Displays the offset value for H.Period setting that you may have configured from LCD menu. This value is added to H.Period setting and then take effect in the video image.
	V.Position Offset	Displays the offset value for V.Position setting that you may have configured from LCD menu. This value is added to V.Position setting and then take effect in the video image.
	V.Width Offset	Displays the offset value for V.Width setting that you may have configured from LCD menu. This value is added to V.Width setting and then take effect in the video image.
	V.Period Offset	Displays the offset value for V.Period setting that you may have configured from LCD menu. This value is added to V.Period setting and then take effect in the video image.
Serial Configuration	Baudrate (bps)	Specify a baudrate.
	Bit length	Specify a bit length.
	Stop bit	Specify a stop bit.
	Parity	Specify a parity check method.
	Flow control	Specify a flow control method.
	Data timeout	Specify a serial input timeout by millisecond.
Buffer	Buffer Level	Specify the number of buffer for retransmission.

Video/Audio/Data (at receiver)

Configures the video signal parameters, serial port and buffer size of receivers.



Video/Audio/Data Configuration

Video Configuration

Item	Value	Instruction
H Width	128	0 - 65535 integer
H Period	1664	0 - 65535 integer
H Back Porch	192	0 - 65535 integer
V Width	7	0 - 65535 integer
V Period	798	0 - 65535 integer
V Back Porch	20	0 - 65535 integer
H.Width Offset	50	0 - 100 integer
H.Period Offset	50	0 - 100 integer
H.Back Porch Offset	50	0 - 100 integer
V.Width Offset	50	0 - 100 integer
V.Period Offset	50	0 - 100 integer
V.Back Porch Offset	50	0 - 100 integer

Serial Configuration

Item	Value	Instruction
Baudrate (bps)	19200	Select one
Bit length	8 7	Select one
Stop bit	1 2	Select one
Parity	NONE ODD EVEN	Select one
Flow control	NONE XON/XOFF RTS/CTS	Select one
Data timeout	100	50 - 1000 integer

Buffer

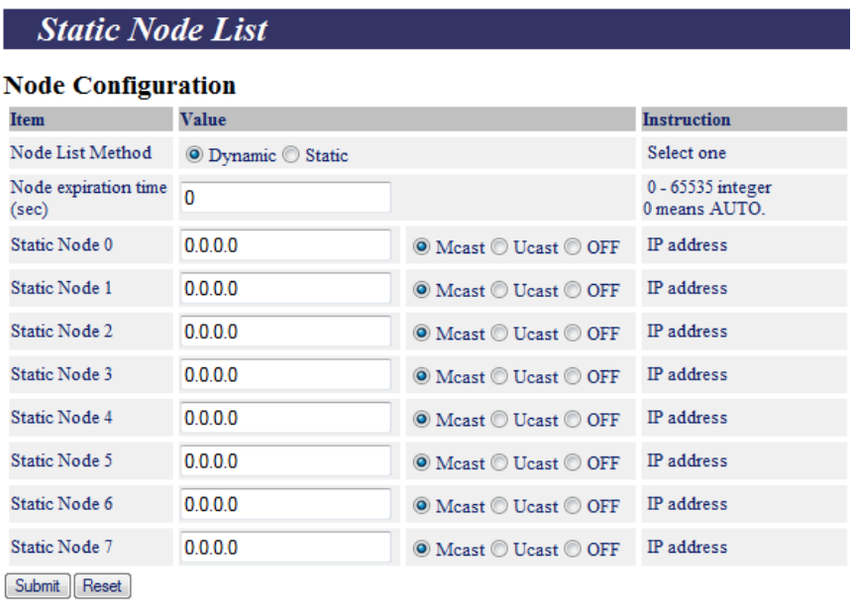
Item	Value	Instruction
Buffering Level	64	5 - 64 integer

Submit Reset

	Name	Details
Video Configuration	H Width	Specify a width of horizontal synchronization signal by dot clock.
	H Period	Specify a period for horizontal synchronization by dot clock.
	H Back Porch	Specify the Back Porch of horizontal synchronization signal by dot clock.
	V Width	Specify a width of vertical synchronization signal by horizontal synchronization signal.
	V Period	Specify a period for vertical synchronization signal by horizontal synchronization signal.
	V Back Porch	Specify the Back Porch by horizontal synchronization signal.
	H.Width Offset	Displays the offset value for H.Width setting that you may have configured from receivers. This value is added to H.Width setting and then take effect in the video image. (* The configuration from receiver is not currently supported.)
	H.Period Offset	Displays the offset value for H.Period setting that you may have configured from receivers. This value is added to H.Period setting and then take effect in the video image. (* The configuration from receiver is not currently supported.)
	H.Back Porch Offset	Displays the offset value for H.Back Porch setting that you may have configured from receivers. This value is added to H.Back Porch setting and then take effect in the video image. (* The configuration from receiver is not currently supported.)
	V.Width Offset	Displays the offset value for V.Width setting that you may have configured from receivers. This value is added to V.Width setting and then take effect in the video image. (* The configuration from receiver is not currently supported.)
	V.Period Offset	Displays the offset value for V.Period setting that you may have configured from receivers. This value is added to V.Period setting and then take effect in the video image. (* The configuration from receiver is not currently supported.)
	V.Back Porch Offset	Displays the offset value for V.Back Porch setting that you may have configured from receivers. This value is added to V.Back Porch setting and then take effect in the video image. (* The configuration from receiver is not currently supported.)
Serial Configuration	Baudrate (bps)	Specify a baudrate.
	Bit length	Specify a bit length.
	Stop bit	Specify a stop bit.
	Parity	Specify a parity check method.
	Flow control	Specify a flow control method.
	Data timeout	Specify a serial input timeout by millisecond.
Buffer	Buffering Level	Specify the number of buffer for retransmission.

Static Node (at transmitter)

Configures Static Node control of transmitter. Usually, the default settings are used.



Static Node List

Node Configuration

Item	Value		Instruction
Node List Method	(•) Dynamic ( ) Static		Select one
Node expiration time (sec)	0		0 - 65535 integer 0 means AUTO.
Static Node 0	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 1	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 2	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 3	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 4	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 5	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 6	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 7	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address

Submit Reset

	Name	Details
Node Configuration	Node List Method	Specify a node search method.
	Static Node 0	Specify an IP address for node when Node List Method is set to Static.
	Static Node 1	
	Static Node 2	
	Static Node 3	
	Static Node 4	
	Static Node 5	
	Static Node 6	
	Static Node 7	

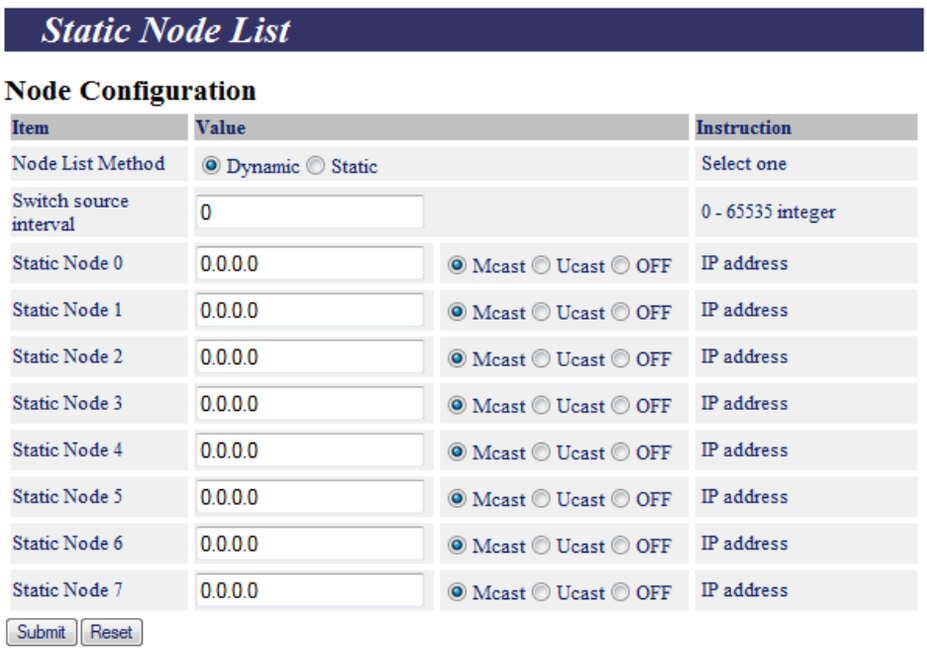
Note

- Use this only for irregular situations such as when you need to specify the node for your network environment. Usually, the default settings are used.

<Static Node>
Use this when you specify receivers. Up to 8 receivers can be specified.
<Dynamic Node>
Change the method of transmission to receiver.

Static Node (at receiver)

Configures Static Node control for receivers. Usually, the default settings are used.



Static Node List

Node Configuration

Item	Value		Instruction
Node List Method	(•) Dynamic ( ) Static		Select one
Switch source interval	0		0 - 65535 integer
Static Node 0	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 1	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 2	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 3	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 4	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 5	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 6	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address
Static Node 7	0.0.0.0	(•) Mcast ( ) Ucast ( ) OFF	IP address

Submit Reset

	Name	Details
Node Configuration	Node List Method	Specify a node search method.
	Switch source interval	Set a time interval to switch the MVDS transmitter automatically when two or more transmitters are installed to the network.
	Static Node 0	Specify an IP address for node when Node List Method is set to Static.
	Static Node 1	
	Static Node 2	
	Static Node 3	
	Static Node 4	
	Static Node 5	
	Static Node 6	
	Static Node 7	

Note

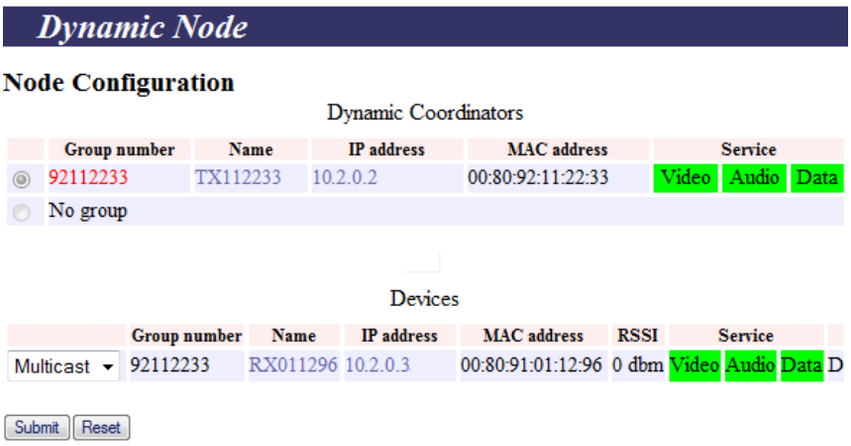
- Use this only for irregular situations such as when you need to specify a node for your network environment or you need to switch the transmitter every certain period of time. Usually, the default settings are used.

<Static Node>
Use this when you specify the contents (transmitter) or switch it every certain period of time.
<Dynamic Node>
Use this when you switch the group manually.

Dynamic Node (at transmitter)

Configures Dynamic Node control for transmitter.

Shows the list and status of receivers connected to a particular group and changes the transmission method.



	Name	Details
Node Configuration	Dynamic Coordinators	Display a list of the discovered groups. The group number in red is the group where the transmitter belongs to. The group number is last 8 digits of Mac Address of the transmitter.
	Devices	Display a list of receivers. Also, the method to transfer data to receivers can be switched here. Name / Details Multicast: Distributing data in multicast. Unicast: Distributing data in unicast. OFF: Receiving data from other transmitter, or data distribution is disabled. By changing "Multicast" or "Unicast" to "OFF", the data distribution to the receiver is disabled. By changing "OFF" to "Multicast" or "Unicast", the distribution is enabled (the receiver is added to the group). "RSSI" indicates a signal strength of each receiver.

Note

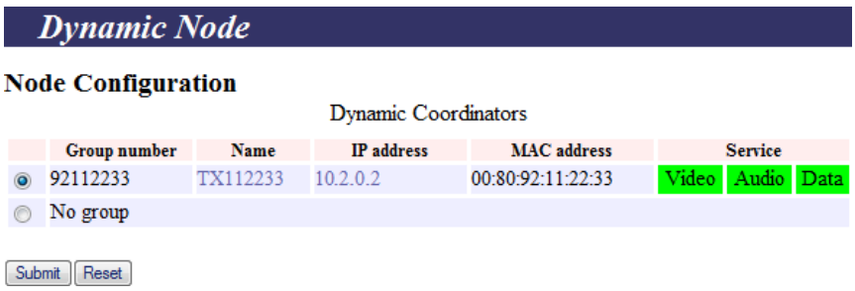
<Dynamic Node>

Change the method of transmission to receiver.

Dynamic Node (at receiver)

Configures Dynamic Node control for receivers.

Shows or Changes which transmitter the receivers should connect to.



	Name	Details
Node Configuration	Dynamic Coordinators	Display the list of discovered groups. The group where the receiver belongs to is checked on its radio button. The group number is the last 8 digits of MAC Address of the transmitter. To switch to the other group, check the radio button of that group. If "No group" is checked, the receiver will not receive data.

Note

<Dynamic Node>

Use this when you switch the group manually.

3.2.3 Tools

Performs reboot, factory default configuration and firmware update.
Click the button of item that you wish to execute.

Common

Reboots, resets and updates the firmware of this product.

	Name	Details
Reset menu	Reboot	Reboot this product.
	Restore to Factory Default	Reset this product to the factory default settings. Please note that IP address is also reset after the reboot.
Firmware Update	-	Load a new firmware released by Silex into this product.

Video/Audio (at transmitter)

Adjusts the screen image for transmitter and changes the maintenance screen to be displayed for receivers.
The screen currently being captured can be applied as a maintenance screen.

	Name	Details
Manage custom screen	Refresh	Refreshes the Web page.
	Maintenance mode	Check a radio button of the screen you wish to configure. By clicking the data size, you can download the image.
	Capture	Captures the image being input and applies to the maintenance screen.
	Upload	Uploads the image data from the PC. The image data that can be uploaded are limited to the one that you have downloaded.
	Delete	Deletes the image data.
Tx device tool	Maintenance screen mode	Sends the maintenance screen for monitor adjustment to receivers. Output with **Start** button and stop with **Stop** button.
	Video signal auto configuration	Adjusts the video signal parameters of the transmitter automatically. Click **Start** to begin.

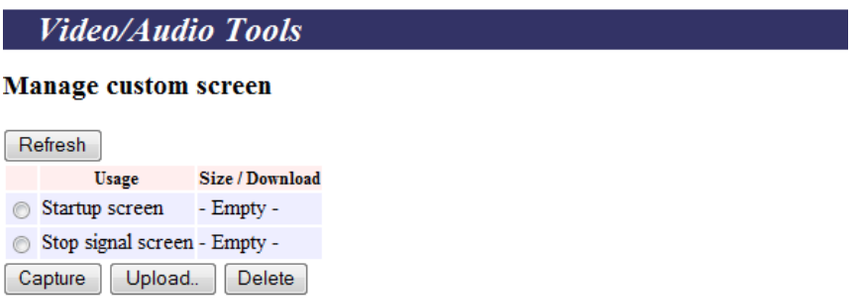
TIP

- To **Capture**, **Upload** and **Delete** the image data, the radio button next to **Maintenance mode** needs to be checked.

Video/Audio (at receiver)

Changes the startup screen and stop signal screen for receivers.

The screen currently being output to monitors from receivers can be captured and then applied as startup screen and/or stop signal screen of receiver.



	Name	Details
Manage custom screen	Refresh	Refreshes the Web page. (After the capture process below, the data size status will not be refreshed automatically. By clicking this button, the Web page can be refreshed.)
	Startup screen	Check a radio button of the screen you wish to configure. By clicking the data size, you can download the image.
	Stop signal screen	
	Capture	Captures the image being played and applies to the selected screen.
	Upload	Uploads the image data from the PC. The image data that can be uploaded are limited to the one that you have captured.
	Delete	Deletes the image data.

TIP - To **Capture**, **Upload** and **Delete** the image data, the radio button next to **Startup screen** or **Stop signal screen** needs to be checked.

A

Appendix

A-1 Configuration item list

The below is the list of configuration item:

Parameter name	Description	Value range	Default value	TX	RX
Host Name	Set a host name.	Up to 15 characters	**Transmitter:** "**TX**" plus the last 6 digits of the Mac Address, or the value of rotary switch **Receivers:** "**RX**" plus the last 6 digits of the Mac Address, or the value of rotary switch	*	*
Root password	Set passwords for Web and Telnet.	Up to 7 characters	None	*	*
LCD Contrast	Set a contrast for LCD.	0 - 8 (0:Darkest, 8: Lightest)	3	*	-
Menu idle timeout	Set the amount of time before the LCD menu returns to the initial screen when it is idle. (1=10sec)	0 - 60	18	*	-
PIN CODE	Set a PIN CODE to enter into ADMIN MODE MENU in LCD.	0 - 9999	0000	*	-
IP Address	Set an IP Address.	IP Address	0.0.0.0	*	*
Subnet Mask	Set a Subnet Mask.	IP Address	0.0.0.0	*	*
Default Gateway	Set a Default Gateway.	IP Address	0.0.0.0	*	*
Wireless Interface	Enable/Disable the Wireless.	ENABLE, DISABLE	DISABLE	*	*
Wireless Mode	Select the Wireless connection mode.	AdHoc, Infra.	AdHoc	*	*
SSID	Specify the SSID.	1 - 32 characters	mvds	*	*
Ch Auto Search	Enable/Disable an available channel auto-search function.	ENABLE, DISABLE	ENABLE	*	-
Channel	Specify a Channel to use.	(When the location is US:) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161, 165	1	*	*
Data Rate	Specify a transmission bit rate.	AUTO, 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps	36Mbps	*	*
Network Authentication	Specify an authentication method.	Open, Shared, WPA, WPA2	Open	*	*
SSID Broadcast	Enable/Disable SSID Broadcast.	ON, OFF	ON	*	-
WEP	Enable/Disable the WEP.	OFF, ON	OFF	*	*
Key Index	Specify an index number for WEP key.	1 - 4	1	*	*
Key Size	Specify a key length for WEP key.	64bit, 128bit	64bit	*	*
WEP Key 1	Specify the WEP key.	When 64bit key is specified: 10 hexadecimal characters or 5 ASCII characters. When 128bit key is specified: 26 hexadecimal characters or 13 ASCII characters.	None	*	*
WEP Key 2					
WEP Key 3					
WEP Key 4					
WPA Encryption Mode	Select an encryption mode of WPA.	TKIP, AES, AUTO	AUTO	*	*

Parameter name	Description	Value range	Default value	TX	RX
Pre-Shared Key	Specify the Pre-Shared Key.	8 - 64 characters	silex technology	*	*
Codec size	Specify a codec size for 1 frame.	32 - 255	64	*	-
Capture Timing	Vertical frequency / (1+x) = FPS (Example) 60[Hz]/(1+[capture timing]2)= 20[fps]	1 - 29	2	*	-
Gain R	Adjust a red gain.	0 - 255	128	*	-
Gain G	Adjust a green gain.				
Gain B	Adjust a blue gain.				
Filter R	Adjust a red filter.	0 - - - 300 MHz 1 - - - 150 MHz 2 - - - 75 MHz 3 - - - 50 MHz 4 - - - 30 MHz 5 - - - 15 MHz 6 - - - 7 MHz 7 - - - 4 MHz 8 - - - 550 MHz 9 - - - 500 MHz 10 - - - 450 MHz 11 - - - 400 MHz 12 - - - 350 MHz 13 - - - reserved 14 - - - reserved 15 - - - 600 MHz	15	*	-
Filter G	Adjust a green filter.				
Filter B	Adjust a blue filter.				
Offset R	Adjust a red offset.	0 - 255	128	*	-
Offset G	Adjust a green offset.				
Offset B	Adjust a blue offset.				
H.Position	Specify a horizontal position.	0 - 65535	313	*	-
H.Width	Specify a width of horizontal synchronization signal by dot clock.	0 - 65535	128	*	*
H.Period	Specify a period for horizontal synchronization by dot clock.	0 - 65535	1664	*	*
H.Back Porch	Specify the Back Porch of horizontal synchronization signal by dot clock.	0 - 65535	192	-	*
V.Position	Specify a vertical position.	0 - 65535	21	*	-
V.Width	Specify a width of vertical synchronization signal by horizontal synchronization signal.	0 - 65535	7	*	*
V.Period	Specify a period for vertical synchronization signal by horizontal synchronization signal.	0 - 65535	798	*	*
V.Back Porch	Specify the Back Porch by horizontal synchronization signal.	0 - 65535	20	-	*

Parameter name	Description	Value range	Default value	TX	RX
H.Position Offset	Save the offset value for H.Position setting that you may have configured from LCD menu.	0 - 100	50	*	-
H.Width Offset	Save the offset value for H.Width setting that you may have configured from LCD menu.	0 - 100	50	*	*
H.Period Offset	Save the offset value for H.Period setting that you may have configured from LCD menu.	0 - 100	50	*	*
H.Back Porch Offset	Save the offset value for H.Back Porch setting that you may have configured from LCD menu.	0 - 100	50	-	*
V.Position Offset	Save the offset value for V.Position setting that you may have configured from LCD menu.	0 - 100	50	*	-
V.Width Offset	Save the offset value for V.Width setting that you may have configured from LCD menu.	0 - 100	50	*	*
V.Period Offset	Save the offset value for V.Period setting that you may have configured from LCD menu.	0 - 100	50	*	*
V.Back Porch Offset	Save the offset value for V.Back Porch setting that you may have configured from LCD menu.	0 - 100	50	-	*
PLLGAIN_H	Specify the PLLGAIN VCO Range.	0 : 8-72MHz 1 : 16-144MHz 2 : 16-144MHz 3 : 24-215MHz	1	*	-
PLLGAIN_L	Specify the PLLGAIN Charge Pump Current.	0 - 7	6	*	-
PLLDIV	Specify the ADC PLL Divider ratio. Usually, equivalent to the value of H.Period minus one.	0 - 65535	1687	*	-
CLPDLY	Specify the Clamp Pulse Delay.	0 - 255	8	*	-
CLPDUR	Specify the Clamp Pulse width.	0 - 255	32	*	-
HSOPW	Specify a pulse width of ADC HSOUT.	0 - 255	96	*	-
SYNC_CTRL	Perform a synchronization control.	0 - 255	64	*	-
PHASE_CC	Specify the PHASE for image sampling.	0 - 255	0	*	-
Baudrate	Specify a baudrate.	300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200	19200	*	*
Bit length	Specify a bit length.	8, 7	8	*	*
Stop bit	Specify a stop bit.	1, 2	1	*	*
Parity	Specify a parity check method.	None, Odd, Even	None	*	*
Flow control	Specify a flow control method.	None, XON/XOFF, RTS/CTS	None	*	*
Data Timeout	Specify a serial input timeout by millisecond.	50-1000	100	*	*
Buffer level	Specify the number of buffer for retransmission.	16 - 64	64	*	*
Node List Method	Specify a node search method.	Dynamic, Static	Dynamic	*	*
Static Node 0 - 7	Specify an IP address for node when Node List Method is set to Static.	IP Address	0.0.0.0	*	*